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For Your Creative Products

ELECTRONIC COMPONENTS

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☆New product
★Under development

■LCD Modules

<For industrial appliances>

Display size (cm) [″]	Model No.	Dot format H × V (dot)	Pixel pitch H × V (mm)	Active area H × V (mm)	Display colors	Luminance (cd/m^2) (TYP.)	Interface	Power consumption (W) (TYP.)	Outline dimensions*1 W × H × D (mm) (TYP.)	Weight (g) (MAX.)	Remarks
8.8 [3.5]	LQ035Q3DG03	320 × RGB × 240	0.2205 × 0.2205	70.56 × 52.92	16.19 M	450	CMOS	0.8	76.9 × 63.9 × 4.7	TYP. 42	Long-life LED backlight
8.9 [3.5]	LQ035Q3DY01	240 × RGB × 320	0.2235 × 0.2235	53.64 × 71.52	260 k	600	CMOS	0.5	65.0 × 85.0 × 3.4	40	Advanced Super V, Low reflection technology
9.4 [3.7]	LS037V7DW05	480 × RGB × 640	0.117 × 0.117	56.16 × 74.88	16.77 M	250	CMOS	0.4	65.0 × 89.2 × 4.4	50	Advanced Super V, Transflective LCD, With resistive touch panel
	LS037V7DW06					300			65.0 × 89.2 × 3.6	38	Advanced Super V, Transflective LCD
11 [4.2]	LQ042T1DW01	480 × 272 × RGB	0.1935 × 0.1935	92.88 × 52.632	16.19 M	400	CMOS	2.5	109.5 × 69.0 × 9.6	85	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
11 [4.3]	LQ043T1DG28	480 × 272 × RGB	0.198 × 0.198	95.04 × 53.856	260 k	300	CMOS	0.6	105.5 × 67.2 × 4.2	60	With resistive touch panel
	LQ043T1DG29					360			105.5 × 67.2 × 3.1	45	
	☆LQ043T1DG38G				16.77 M	300			105.5 × 67.2 × 4.2	61	With resistive touch panel
	LQ043Y1DY01	480 × RGB × 800	0.117 × 0.117	56.16 × 93.6		315			62.46 × 105.9 × 2.1	30	Advanced Super V, Low reflection technology
14 [5.7]	LQ057Q3DC03	320 × 240 × RGB	0.36 × 0.36	115.2 × 86.4	260 k	500	CMOS	2.5	144.0 × 104.6 × 12.3	210	Long-life LED backlight, Built-in LED backlight driver circuit
16 [6.4]	LQ064V3DG06	640 × 480 × RGB	0.204 × 0.204	130.56 × 97.92	260 k	350	CMOS	3.0	161.3 × 117.0 × 12.0	TYP. 200	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ064X3LW01	1 024 × RGB × 768	0.12675 × 0.12675	129.792 × 97.344	16.77 M	350	LVDS	5.3	153.4 × 122.0 × 9.9	220	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
18 [7.0]	LQ070Y3LW01	800 × 480 × RGB	0.1905 × 0.1905	152.4 × 91.44	16.19 M	380	LVDS	2.7	170.0 × 110.0 × 9.0	TYP. 175	Advanced Super V, Long-life LED backlight
	LQ070Y3LG01				260 k	350		1.8	164.9 × 104.0 × 3.9	140	
21 [8.4]	LQ084V1DG43	640 × RGB × 480	0.267 × 0.267	170.88 × 128.16	260 k	370	CMOS	4.7	221.0 × 152.4 × 9.3	340	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ084S3LG03	800 × RGB × 600	0.213 × 0.213	170.4 × 127.8	16.19 M	330	LVDS	4.1	199.5 × 154.0 × 11.6	320	Long-life LED backlight, Built-in LED backlight driver circuit
23 [9.1]	LQ091B1LW01	822 × RGB × 260	0.267 × 0.267	219.474 × 69.42	16.77 M	380	LVDS	6.8	240.0 × 86.0 × 10.0	230	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
26 [10.1]	LQ101K1LY05	1 280 × RGB × 800	0.1695 × 0.1695	216.96 × 135.6	16.77 M	400	LVDS	4.2	230.7 × 152.5 × 8.7	270	Advanced Super V, Low reflection technology, Long-life LED backlight, Built-in LED backlight driver circuit
	LQ101W3LG01	1 024 × RGB × 600	0.2175 × 0.2088	222.72 × 125.28	260 k	350		5.1	235.3 × 143.0 × 7.9	350	Long-life LED backlight, Built-in LED backlight driver circuit
26 [10.4]	★LQ104V1DG74	640 × RGB × 480	0.33 × 0.33	211.2 × 158.4	260 k	370	CMOS	(3.4)	227.3 × 177.5 × 9.3	500	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ104V1DG81/LG81					450	CMOS/ LVDS	5.6	246.5 × 179.3 × 12.5	TYP. 500	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ104S1DG2C	800 × RGB × 600	0.264 × 0.264			350	CMOS	4.5	246.5 × 179.3 × 11.0	550	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ104S1LG81					420	LVDS	6.1	246.5 × 179.3 × 12.5	500	Long-life LED backlight, Built-in LED backlight driver circuit

All products listed on this page are LED backlight models.
*1 Protrusions such as positioning bosses are not included.
Note: Please note that the specifications are subject to change without prior notice for product improvement.

RoHS

■LCD Modules

<For industrial appliances> (cont'd)

Display size (cm) [″]	Model No.	Dot format H × V (dot)	Pixel pitch H × V (mm)	Active area H × V (mm)	Display colors	Luminance (cd/m^2) (TYP.)	Interface	Power consumption (W) (TYP.)	Outline dimensions*1 W × H × D (mm) (TYP.)	Weight (g) (MAX.)	Remarks
31 [12.1]	LQ121S1DG81	800 × RGB × 600	0.3075 × 0.3075	246.0 × 184.5	260 k	450	CMOS	6.2	276.0 × 209.0 × 11.0	650	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121S1LG84				260 k	450	LVDS	5.1	276.0 × 209.0 × 9.1	600	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121S1LG86					1 500		12.9			Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121K1LG52	1 280 × RGB × 800	0.204 × 0.204	261.1 × 163.2	16.19 M	430		6.0	278.0 × 184.0 × 8.6	550	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121K1LW56				16.77 M	320		5.2	278.0 × 184.0 × 10.2		Wide Viewing Angle Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121K1LG58				16.19 M	700		5.8	278.0 × 184.0 × 8.6		Long-life LED backlight, Built-in LED backlight driver circuit
	LQ121X3LG02	1 024 × RGB × 768	0.240 × 0.240	245.8 × 184.3	260 k	1 200		9.7	259.0 × 205.0 × 7.5		Long-life LED backlight
38 [15.0]	LQ150X1LG11	1 024 × RGB × 768	0.297 × 0.297	304.1 × 228.1	16.19 M	600	LVDS	8.2	331.6 × 254.7 × 9.3	950	Long-life LED backlight, Built-in LED backlight driver circuit
	LQ150X1LG91					350		6.8	326.5 × 253.5 × 9.6		Long-life LED backlight, Built-in LED backlight driver circuit
	LQ150X1LG96					1 050		14.8			Built-in LED backlight driver circuit
	LQ150X1LX92				16.19 M	270		10.0			Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Haze value 3%
	LQ150X1LX95					400					Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Haze value 3%
	LQ150X1LX96					500					Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Haze value 3%
	LQ150X1LX9K				16.19 M	400					Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Polarized sunglasses supported
	LQ150X1LW12				10 M	350		10.2	331.6 × 254.7 × 9.3		Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
	LQ150X1LW95				16.19 M	400		10.0	326.5 × 253.5 × 9.6		Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
	LQ150X1LW96					500					Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit

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☆New product

■LCD Modules

<For industrial appliances> (cont'd)

Display size (cm) [″]	Model No.	Dot format H × V (dot)	Pixel pitch H × V (mm)	Active area H × V (mm)	Display colors	Luminance (cd/m^2) (TYP.)	Interface	Power consumption (W) (TYP.)	Outline dimensions*1 W × H × D (mm) (TYP.)	Weight (g) (MAX.)	Remarks
40 [15.6]	LQ156T3LW03	1 366 × RGB × 768	0.252 × 0.252	344.232 × 193.536	16.77 M	400	LVDS	16.9	363.8 × 215.9 × 10.8	950	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
	LQ156M1LG21	1 920 × RGB × 1 080	0.17925 × 0.17925	344.16 × 193.59	16.19 M	300/ 350/ 400/ 600	2ch LVDS	13.6 (600cd/ m^2)	370.0 × 217.0 × 9.3		Long-life LED backlight, Built-in LED backlight driver circuit, With brightness control switch
	LQ156M3LW01				16.77 M	400		17.9	363.8 × 215.9 × 10.8		Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
47 [18.5]	LQ185M3LW01	1 920 × RGB × 1 080	0.213 × 0.21300	408.96 × 230.04	16.77 M	400	2ch LVDS	17.5	430.4 × 254.6 × 10.8	TYP. 1 120	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
48 [19.0]	LQ190E1LW52	1 280 × RGB × 1 024	0.294 × 0.294	376.32 × 301.056	16.77 M	450	2ch LVDS	21.7	404.2 × 330.0 × 15.0	1 850	Advanced Super V, Long-life LED backlight
	LQ190E1LW72					350		19.6	396.0 × 323.6 × 11.5	1 300	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
	LQ190E1LX75/T					350		19.6			Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Haze value 3%
	LQ190N1LW01	1 680 × RGB × 1 050	0.24375 × 0.24375	409.5 × 255.9375		300		20.2	444.0 × 283.3 × 15.5	1 600	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
51 [20.1]	LQ201U1LW31	1 600 × XYZ × 1 200	0.255 × 0.255	408.0 × 306.0	256 gray scale	1 000	2ch LVDS	25.7	436.0 × 335.0 × 20.4	2 400	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit, Monochrome
	LQ201U1LW32	1 600 × RGB × 1 200			16.77 M	330					Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
59 [23.1]	LQ231U1LW32	1 600 × RGB × 1 200	0.294 × 0.294	470.4 × 352.8	16.77 M	500	2ch LVDS	65.5	530.0 × 431.5 × 23.9	4 500	Advanced Super V, Long-life LED backlight, Built-in LED backlight driver circuit
69 [27.0]	☆LQ270M1LX01	1 920 × RGB × 1 080	0.303 × 0.303	581.76 × 363.6	16.77 M	500	2ch LVDS	43.5	620.0 × 407.6 × 22.0	3 800	Advanced Super V, Long-life LED backlight

All products listed on this page are LED backlight models.
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☆New product

RoHS

LCD

<For digital signage displays>

Display size (cm) [″]	Model No.	Dot format H × V (dot)	Pixel pitch H × V (mm)	Active area H × V (mm)	Display colors	Lumi-nance (cd/m²) (TYP.)	Interface	Outline dimensions*1 W × H × D (mm) (TYP.)	Weight (kg)	Remarks
176.56 [69.5]	☆LQ695D3LG21	1 920 × RGB × 1 080	0.802 × 0.802	1 538.88 × 865.62	1.07B 8-bit + 2-bit FRC	700	LVDS	1 566.0 × 901.8 × 27.0	26.5±1.5	Backlight type: edge-lit LED (built-in driver) SFR (60 Hz input–60 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape
	LQ695D3LG02					350		1 559.4 × 893.0 × 27.5		Backlight type: edge-lit LED (built-in driver) DFR (120 Hz input–120 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape
	LK695D3LA48				16.70 M 8-bit	450		1 566.0 × 901.8 × 29.6	26.0±1.0	Backlight type: edge-lit LED (built-in driver) SFR (60 Hz input–60 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape
	LK695D3LA58					700				
	☆LQ695R3VG03	3 840 × RGB × 2 160	0.401 × 0.401		1.07B 8-bit + 2-bit FRC	330	V by One	1 559.4 × 893.0 × 27.5	27.5±1.5	Backlight type: edge-lit LED (built-in driver) SFR (60 Hz input–60 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape
203.21 [80]	LK800D3LA28	1 920 × RGB × 1 080	0.9225 × 0.9225	1 771.20 × 996.30	1.07B 8-bit + 2-bit FRC	350	LVDS	1 820.2 × 1 045.3 × 34.4	34.0±1.0	Backlight type: edge-lit LED (built-in driver) DFR (60 Hz input–120 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape
	LK800D3LA38					500				
	LK800D3LA48					700				
228.66 [90]	☆LQ900D3LA0x	1 920 × RGB × 1 080	1.038 × 1.038	1 992.96 × 1 121.04	1.07B 8-bit + 2-bit FRC	500	LVDS	2 032.0 × 1 168.0 × 80.0	46.5±1.0	Backlight type: direct-lit LED (built-in driver) DFR (120 Hz input–120 Hz output) Viewing angle (L/R / U/D): 176° / 176° Orientation: portrait / landscape

*1 Excluding FPC for connection and other protruding parts.

RoHS

<For wearable & mobile terminal device (low power consumption LCD)>

Display size (cm) [″]	Model No.	Dot format H × V (dot)	Pixel pitch H × V (mm)	Active area H × V (mm)	Display colors	Luminance (cd/m^2) (TYP.)	Interface	Power consumption*1 (μW) (TYP.)	Outline dimensions*2 W × H × D (mm) (TYP.)	Weight (g) (MAX.)	Remarks
3.2 [1.26]	LS013B7DH05	144 × 168	0.145 × 0.145	20.88 × 24.36	B/W	No B/L	Serial	35	24.68 × 30.00 × 0.745	1.1	
3.3 [1.28]	LS013B7DH03	128 × 128	0.180 × 0.180	23.04 × 23.04	B/W	No B/L	Serial	50	26.6 × 30.3 × 0.741	1.3	
6.9 [2.7]	LS027B7DH01	400 × 240	0.147 × 0.147	58.8 × 35.28	B/W	No B/L	Serial	175	62.8 × 42.82 × 1.64	10.6	
11.2 [4.4]	LS044Q7DH01	320 × 240	0.280 × 0.280	89.6 × 67.2	B/W	No B/L	Serial	600	94.8 × 75.2 × 1.64	29.3	

*1 Data update mode (Display pattern: Vertical stripe display)
*2 Protrusion such as positioning bosses are not included.
Note: Please note that the specifications are subject to change without prior notice for product improvement.

CMOS IMAGE SENSORS FOR DIGITAL CAMERAS/ DIGITAL CAMCORDERS

RoHS

■CMOS Image Sensors for Digital Cameras/Digital Camcorders

Optical format	Total pixels	Color filter	Model No.	Video performance	Resolution Image pixels (H × V)	Pixel size H × V (μm)	Sensitivity (mV/Lux-sec) TYP.	Package
1 type	13 110 k	R, G, B primary color mosaic filters	RJ5DY1BA0LT	4K2K 60 fps	4 144 × 3 096	3.1 × 3.1	1 420	N-LCC120-R898
		B/W	RJ5DY2BA0LT				2 340	
2/3 type	2 320 k	R, G, B primary color mosaic filters	RJ52N1BA0LT	1 080p 120 fps	1 984 × 1 116	5.0 × 5.0	3 520	N-LCC120-R898A
		B/W	RJ52N2BA0LT				5 200	
	9 130 k	R, G, B primary color mosaic filters	RJ52V1BA0LT	4K2K 60 fps	3 968 × 2 232	2.5 × 2.5	1 780	
		B/W	RJ52V1BA1LT				2 600	

RoHS

High-sensitivity Image Sensors for Security Usage

■Progressive CCDs

Optical format	Total pixels	Model No.	Video performance	Color filter	Resolution Image pixels (H × V)	Pixel size H × V (μm)	Sensitivity*1 (mV) TYP.	Smear ratio (dB) TYP.	Package
1/3 type	350 k	RJ33B3AA0DT*2	VGA 120 fps (1 ch output)	Primary color	660 × 494	7.4 × 7.4	3 000	–125	P-DIP024-0400
		RJ33B4AA0DT*2		B/W			4 500		
		RJ33B3AD0DT*2	VGA 200 fps (2 ch output)	Primary color			3 000		
		RJ33B4AD0DT*2		B/W			4 500		
	520 k	RJ3331AA0PB	NTSC 650 TV lines	Complementary color	976 × 494	5.0 × 7.4	1 500	–120	P-DIP016-0450
	610 k	RJ3341AA0PB	PAL 650 TV lines	Complementary color	976 × 582	5.0 × 6.3			
	1 350 k	RJ33J3CA0DT*2	1.3M 30 fps 720p 30 fps (1 ch output)	Primary color	1 320 × 976	3.75 × 3.75	950	–120	P-DIP024-0400
		RJ33J4CA0DT*2		B/W			1 430		
1/2 type	2 170 k	RJ31N3EA0DT*2	1 080p 25 fps (1 ch output)	Primary color	1 928 × 1 088	3.65 × 3.65	750	–115	P-DIP028-0566
		RJ31N4EA0DT*2		B/W			1 150		
		RJ31N3ED0DT*2	1 080p 50 fps (2 ch output)	Primary color			750		
		RJ31N4ED0DT*2		B/W			1 150		
1/1.8 type	2 100 k	RJ31N3AA0DT	2M 25 fps (1 ch output)	Primary color	1 644 × 1 236	4.4 × 4.4	1 100	–120	
		RJ31N4AA0DT		B/W			1 650		
	2 130 k	RJ31N3AD0DT	2M 50 fps (2 ch output)	Primary color			1 100		
		RJ31N4AD0DT		B/W			1 650		
	2 960 k	RJ31P3AA0DT*2	2.8M 17 fps (1 ch output)	Primary color	1 940 × 1 460	3.69 × 3.69	750	–115	
		RJ31P4AA0DT*2		B/W			1 150		
		RJ31P3AD0DT*2	2.8M 30 fps (2 ch output)	Primary color			750		
		RJ31P4AD0DT*2		B/W			1 150		

*1 The average G signal output voltage (the average output voltage in the case of the complementary color filter) when a 1,000-lux light source with a 90% reflector is imaged by a lens of F4 at 1/30 sec (1/25 sec in the case of RJ3341AA0PB) frame accumulation.
*2 This model is the next-generation model. Light efficiency including the near-infrared light region has been drastically improved by our process technology.

RoHS

■Progressive CCDs (cont'd)

Optical format	Total pixels	Model No.	Video performance	Color filter	Resolution Image pixels (H × V)	Pixel size H × V (μm)	Sensitivity*1 (mV) TYP.	Smear ratio (dB) TYP.	Package
2/3 type	5 240 k	RJ32S3AA0DT	5M 9 fps (1 ch output)	Primary color	2 456 × 2 058	3.45 × 3.45	530	–110	P-DIP028-0566
		RJ32S4AA0DT		B/W			800		
		RJ32S3AD0DT	5M 15 fps (2 ch output)	Primary color			530		
		RJ32S4AD0DT		B/W			800		
		RJ32S3AF0DT*2	5M 30 fps (4 ch output)	Primary color	2 456 × 2 056		580		P-DIP064-1000
		RJ32S4AF0DT*2		B/W			870		
1/1 type	6 090 k	RJ3DT3AF0DT*2	6M 30 fps (4 ch output)	Primary color	2 758 × 2 208	4.54 × 4.54	1 150	–125	P-DIP064-1000
		RJ3DT4AF0DT*2		B/W			1 750		
	8 290 k	RJ3DV3AF0DT*2	8M 25 fps (4 ch output)	Primary color	3 320 × 2 496	3.88 × 3.88	750	–120	
		RJ3DV4AF0DT*2		B/W			1 100		
4/3 type	8 340 k	RJ3EV3EF0DT*2	8M 25 fps (4 ch output)	Primary color	3 848 × 2 168	5.14 × 5.14	1 500	–125	P-DIP064-1000B
		RJ3EV4EF0DT*2		B/W			2 250		

*1 The average G signal output voltage when a 1,000-lux light source with a 90% reflector is imaged by a lens of F4 at 1/30 sec frame accumulation.
*2 This model is the next-generation model. Light efficiency including the near-infrared light region has been drastically improved by our process technology.

■1/3-type CCDs

Total pixels	Standard		Model No.	Resolution		Pixel size H × V (μm)	Sensitivity*1 (mV) TYP.	Smear ratio (dB) TYP.	Package
				Horizontal TV lines	Image pixels (H × V)				
410 k	Color	NTSC	RJ2355DA0PB	480	768 × 494	6.4 × 7.5	2 700	–135	P-DIP016-0450
470 k		PAL	RJ2365DA0PB		752 × 582	6.53 × 6.39			
520 k		NTSC	RJ2331BA0PB	650	976 × 494	5.0 × 7.4	2 400	–125	
610 k		PAL	RJ2341BA0PB		976 × 582	5.0 × 6.3			

*1 The average output voltage measured when imaging a 90% reflector illuminated by a 1,000-lux light source through an optical system set at an f number of F4.0.

■1/4-type CCDs

Total pixels	Standard		Model No.	Resolution		Pixel size H × V (μm)	Sensitivity*1 TYP. (mV)	Smear ratio TYP. (dB)	Package
				Horizontal TV lines	Image pixels (H × V)				
270 k	Color	NTSC	RJ2411FA0PB	330	512 × 492	7.2 × 5.6	1 800	–130	P-DIP014-0400A
320 k		PAL	RJ2421FA0PB		512 × 582	7.2 × 4.73	1 650		
410 k		NTSC	RJ2455DA0PB	480	768 × 494	4.9 × 5.6	1 350	–120	
470 k		PAL	RJ2465DA0PB		752 × 582	5.0 × 4.77			
520 k		NTSC	RJ2431AA0PB	650	976 × 494	3.75 × 5.56	1 400		
610 k		PAL	RJ2441AA0PB		976 × 582	3.75 × 4.74			

*1 The average output voltage measured when imaging a 90% reflector illuminated by a 1,000-lux light source through an optical system set at an f number of F4.0.

RoHS

■LED Drivers

◆Built-in Step-up Circuit

Model No.	Function	Features	No. of output circuits	Number of LEDs	Booster method	Constant current circuit	Switching transistor	Input voltage range (V)	Output*1 current (mA) MAX.	Oscillation frequency (Hz) TYP.	Package
IR2E58U	White LED driver for backlight	• Capable of driving a maximum of 96 LEDs with 12 LEDs (in series) per channel • Built-in step-up DC-DC converter • High oscillation frequency (1.5 MHz) makes use of a small coil possible • Capable of controlling brightness using PWM control • Step-up output control according to LED-Vf	8	96	PWM	○	○	4.5 to 28	40/ch	500 k to 1.5 M	24HQFN
IR2E71Y	LED driver for backlight and call alert display (auto brightness adjustment)	• 2 ch (11 LEDs × 2 ch) LED driver for backlight • Auto brightness adjustment backlight LED • 6 ch RBG LED driver for illumination • Built-in switching regulator for LCD backlight • Built-in LCD controller power supply (+5.8 V / –5.8 V MAX.) • LDO 1 ch • Interface for digital-output proximity sensor with ambient light sensor • Built-in general purpose input/output port (7 ch MAX.)	Backlight 2 RGB 6	Backlight 22 RGB 6	PWM	○	○	3.0 to 4.5	Backlight 25.5/ch RGB 12.7/ch	10 k to 1 M	35WL-CSP
IR2E67M	White LED driver for backlight	• Built-in 10 ch. constant-current control amplifier (external output transistor) • Enables driving LEDs up to external transistor voltage limit • Built-in timing controller for lighting • Wider range of PWM brightness control possible, from simultaneous total output control to local dimming • Step-up output control according to LED-Vf	10	*2	*3	*4	External	4.5 to 5.5	*5	–	80LQFP-1420
IR2E70N	White LED driver for backlight	• Built-in step-up DC-DC controller for 2 ch individual control • Capable of 2 ch individual PWM brightness control • LED current value adjustable by external signal (voltage input / PWM signal) • Brightness control possible at high contrast ratio 3000:1 • Step-up output control according to LED-Vf	2	*2	PWM	*6	External	4.5 to 5.5 8 to 28	*5	100 k to 500 k	24SSOP

*1 Constant current (MAX.)
*2 Determined by external transistor voltage limit.
*3 Built-in feedback voltage-generating circuit for external power supply.
*4 Built-in constant-current control amplifier (external output transistor)
*5 Determined by external resistor.
*6 Constant current can be controlled by LED anode voltage control.

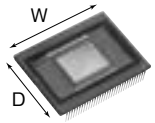
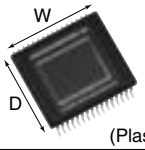
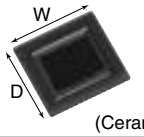
■AC-DC Conversion Type ICs for LED Lighting

Model No.	Features	Operating temperature range (°C)	Supply voltage range (V)	Dissipation current (mA) TYP.	Switching frequency (kHz)*1 TYP.	Gate driver capacity		System	Package
						Low (Ω)	High (mA)		
IR3M92N4	Overvoltage/overheat/overcurrent circuits, high-speed activation, stand-by feature, PWM brightness control	−30 to +100	10 to 18	1	160	MAX. 15	MIN. 40	Flyback Step-down	SOP-8

*1 When operating a flyback converter

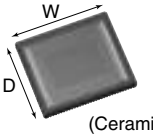
RoHS

◆For CCDs

Package type	Appearance (Package material)	Package code	No. of terminals	Terminal pitch mm	Nominal dimensions mm (mil)	Package depth & width (D × W) × (seated height [TYP.]) mm
DIP	 (Plastic)	P-DIP014-0400A	14	1.27	10.16 (400)	10.0 × 10.0
		P-DIP016-0450	16	1.27	11.43 (450)	11.4 × 12.2
		P-DIP020-0500	20	1.27	12.2 (500)	12.0 × 13.8
		P-DIP024-0400	24	0.80	10.16 (400)	10.0 × 10.0
		P-DIP028-0566	28	1.11	14.4 (566)	14.2 × 16.0
		P-DIP064-1000	64	1.00	25.48 (1 000)	36.1 × 25.4
		P-DIP064-1000B				
SOP	 (Plastic)	P-SOP014-0400A	14	1.27	12 (470)	10.0 × 10.0 × (4.1)
		P-SOP028-0400	28	0.69	10.16 (400)	10.0 × 10.0 × (3.5)
		P-SOP032-0525	32	0.78	13.3 (525)	12.0 × 13.8 × (3.92)
LCC	 (Ceramic)	N-LCC040-R350 (B)	40	0.65	8.9 (350)	8.3 × 8.9 × (1.52)
		N-LCC040-S433A		0.80	11.0 (433)	11.0 × 11.0 × (1.62)

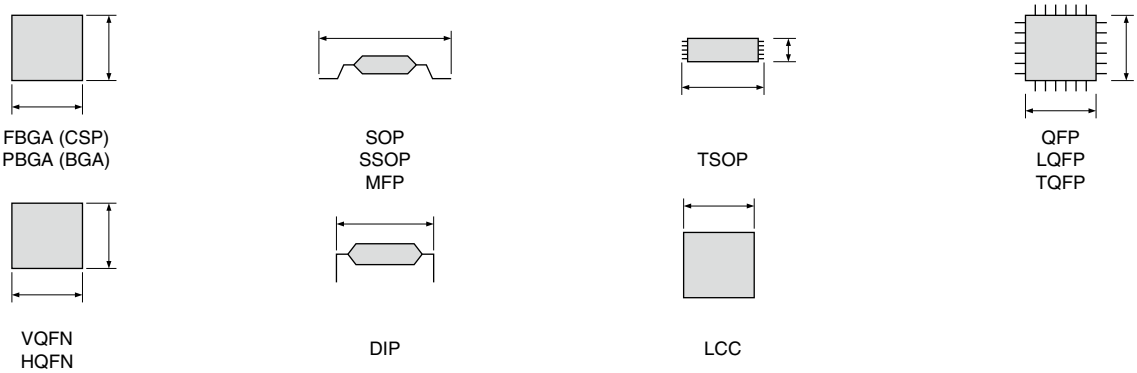
100 mil = 2.54 mm

◆For CMOSs

Package type	Appearance (Package material)	Package code	No. of terminals	Terminal pitch mm	Nominal dimensions mm (mil)	Package depth & width (D × W) × (seated height [TYP.]) mm
LCC	 (Ceramic)	N-LCC120-R898	120	0.65	22.8 (898)	20.0 × 22.8 × (2.67)
		N-LCC120-R898A				

100 mil = 2.54 mm

Nominal dimensions



FBGA: fine-pitch ball grid array package
PBGA: plastic ball grid array package
SOP: small outline package
SSOP: shrink small outline package
MFP: mini flat package
TSOP: thin small outline package
QFP: quad flat package
LQFP: low profile quad flat package
TQFP: thin quad flat package
VQFN: very thin quad flat non-leaded package
HQFN: heat sink quad flat non-leaded package
DIP: dual inline package
LCC: leadless chip carrier

Ball Grid Array and BGA are trademarks of Motorola Nippon Ltd.

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■Photocoupler Lineup

<Phototransistor output type>

Package type	Output type	Features		Model No. (series)	Page
Mini-flat 4-pin Compact, SMT type	Single phototransistor	General purpose, High collector-emitter voltage		PC357NJ0000F / PC451J00000F	15
			Low input current	PC367NJ0000F	15
		AC input response		PC354NJ0000F	15
	Darlington phototransistor	High sensitivity, High collector-emitter voltage	Low input current	PC364NJ0000F	15
				PC355NJ0000F / PC452J00000F	15
			Low input current	PC365NJ0000F	15
Compact, Half pitch (lead space), SMT type	Single phototransistor	General purpose, High resistance to noise, etc.		PC3H7J00001H	16
			Reinforced insulation	PC3HU7xYIP1B	16
			Low input current	PC3H71xNIP1H	16
		AC input response		PC3H3J00001H / PC3H4J00001H	16
DIP type (4-pin)	Single phototransistor	Reinforced insulation		PC123XxYSZ1B	17
(4-pin, DIP type)			Low input current	PC1231xNSZ1B	17
		General purpose, High collector-emitter voltage, etc.		PC817XxNSZ1B / PC851XNNSZ1H	17
			Low input current	PC8171xNSZ1B	17
	Darlington phototransistor	High sensitivity, High collector-emitter voltage		PC852XNNSZ1H	17

<OPIC output type>

Package type	Output type	Features	Model No. (series)	Page
Compact, SMT type	Digital output	General purpose, High response speed	PC400J00000F	18
	Analog/Digital output	High CMR	PC457L0NIP0F	18

RoHS

■Photocouplers

◆Phototransistor Output Type <Compact, SMT type>

○: Approved

(Ta = 25°C)

Output type	Model No.	Internal connection diagram	Features	Approved by safety standards*2	Package	Absolute maximum ratings			Electro-optical characteristics						
									Current transfer ratio			Response time			
				UL		Forward current I_F (mA)	Isolation voltage (AC) Viso (rms) (kV)	Collector-emitter voltage V_{CEO} (V)	CTR (%) MIN.	I_F (mA)	V_{CE} (V)	tr (μs) TYP.	I_C (mA)	R_L (Ω)	V_{CE} (V)
Single phototransistor output	PC357NJ0000F		General purpose	○	Mini-flat 4-pin	50	3.75	80	50	5	5	4	2	100	2
	PC451J00000F		High collector-emitter voltage	○		50	3.75	350	40	5	5	4	2	100	2
	PC367NJ0000F		Low input current, high resistance to noise*1	○		10	3.75	80	100	0.5	5	4	2	100	2
	PC354NJ0000F		AC input response	○		±50	3.75	80	20	±1	5	4	2	100	2
	PC364NJ0000F		Low input current, AC input response, high resistance to noise*1	○		±10	3.75	80	50	±0.5	5	4	2	100	2
Darlington photo-transistor output	PC355NJ0000F		High sensitivity	○		50	3.75	35	600	1	2	60	2	100	2
	PC365NJ0000F		High sensitivity, low input current	○		10	3.75	35	600	0.5	2	60	10	100	2
	PC452J00000F		High collector-emitter voltage	○		50	3.75	350	1 000	1	2	100	20	100	2

*1 CMR: MIN. 10 kV/μs
*2 Please refer to Specification Sheets for model numbers approved by safety standards.

PC357NJ0000F
(Mini-flat 4-pin)

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◆Phototransistor Output Type
<Compact, half pitch (lead space) SMT type>

○: Approved
△: Please confirm with our sales representatives.

(Ta = 25°C)

Output type	Model No.	Internal connection diagram	Features	Approved by safety standards			Package	Absolute maximum ratings			Electro-optical characteristics						
											Current transfer ratio			Response time			
				UL	VDE	Others		Forward current I_F (mA)	Isolation voltage (AC) Viso (rms) (kV)	Collector-emitter voltage V_{CEO} (V)	CTR (%) MIN.	I_F (mA)	V_{CE} (V)	tr (μs) TYP.	I_C (mA)	R_L (Ω)	V_{CE} (V)
Single phototransistor output	PC3HU7xYIP1B		Reinforced insulation (internal insulation distance: MIN. 0.4 mm)	○	○	○	Mini-flat 4-pin	50	3.75	80	50	5	5	4	2	100	2
	PC3H7J00001H		Standard	○	–	○		50	2.5	80	20	1	5	4	2	100	2
	PC3H71xNIP1H		High resistance to noise*1, low input current	○	–	○		10	2.5	80	100	0.5	5	4	2	100	2
	PC3H3J00001H		AC input response, high resistance to noise*1	○	–	–		±50	2.5	80	20	±1	5	4	2	100	2
	PC3H4J00001H		AC input response	○	–	○		±50	2.5	80	20	±1	5	4	2	100	2

*1 CMR: MIN.10 kV/μs

PC3HU7xYIP1B

PC3H7J00001H
(Mini-flat 4-pin)

Notice
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.
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*RoHS Directive: Prohibits use of lead, cadmium, hexavalent chromium, mercury and specific brominated flame retardants (PBBs and PBDEs), with certain exceptions.
Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

◆Phototransistor Output Type <DIP type (4-pin)>

○: Approved
△: Please confirm with our sales representatives. (Ta = 25°C)

Output type	Model No.	Internal connection diagram	Features	Approved by safety standards*7			Package	Absolute maximum ratings			Electro-optical characteristics			
				UL	VDE *2	Others *3		Forward current I_F (mA)	Isolation voltage (AC) Viso (rms) (kV)	Collector-emitter voltage V_{CEO} (V)	Current transfer ratio CTR (%) MIN.	I_F (mA)	Response time tr (μs) TYP.	R_L (Ω)
Single phototransistor output	PC123XxYSZ1B*1, 5, 6		High isolation voltage, reinforced insulation	○	○	○	4-pin DIP	50	5.0	80	50	5	4	100
	PC1231xNSZ1B*1		High isolation voltage, reinforced insulation, low input current, high resistance to noise*4	○	○	○		10	5.0	80	50	0.5	4	100
	PC817XxNSZ1B*5		High isolation voltage	○	–	○		50	5.0	80	50	5	4	100
	PC8171xNSZ1B*5		High isolation voltage, low input current, high resistance to noise*4	○	–	–		10	5.0	80	100	0.5	4	100
	PC851XNNSZ1H*5		High isolation voltage, high collector-emitter voltage	○	–	–		50	5.0	350	40	5	4	100
Darlington phototransistor output	PC852XNNSZ1H*5		High isolation voltage, high collector-emitter voltage	○	–	–		50	5.0	350	1 000	1	100	100

*1 Wide lead spacing type is also available. Creepage distance: 6.4 mm or more, wide lead spacing type: 8 mm or more.
*2 Optionally available.
*3 BSI, SEMKO, DEMKO, NEMKO, FIMKO, CSA
*4 CMR: 10 kV/μs MIN.
*5 Lead forming type is also available for surface mounting.
*6 Wide lead spacing type is also available. Compatible with wide lead spacing type lead-forming models for surface-mount use.
*7 Please refer to Specification Sheets for model numbers approved by safety standards.

PC817XxNSZ1B
(4-pin DIP)

◆OPIC Output

("OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

<Compact, SMT type> (1-1)

○: Approved

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Approved by safety standards*2		Package	Absolute maximum ratings		Electro-optical characteristics*1						
								Low level output voltage				Threshold input current		
			UL	VDE*3		Forward current I_F (mA)	Isolation voltage (AC) Viso (rms) (kV)	V_{OL} (V) MAX.	Ta (°C)	I_{OL} (mA)	I_F (mA)	I_{FHL} (mA) MAX.	I_{FLH} (mA) MAX.	R_L (Ω)
PC400J00000F		Digital output, normal-off operation	○	–	Mini-flat 5-pin	50	3.75	0.4	0 to +70	16	4	2.0	–	280

A: Rated voltage circuit
*1 Each item is measured at Vcc=5V. (PC400)
*2 Please refer to Specification Sheets for model numbers approved by safety standards.
*3 Optionally available.

<Compact, SMT type> (1-2)

○: Approved

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Approved by safety standards*1		Package	Absolute maximum ratings		Electro-optical characteristics							
								Current transfer ratio				Propagation delay time			
			UL	VDE*2		Forward current I_F (mA)	Isolation voltage (AC) Viso (rms) (kV)	CTR (%) MIN.	I_F (mA)	V_O (V)	V_{CC} (V)	t_{PHL} (µs) TYP.	t_{PLH} (µs) TYP.	R_L (Ω)	I_F (mA)
PC457L0NIP0F		High speed (1 Mb/s), high CMR (15 kV/µs), for flow soldering	○	○	Mini-flat 5-pin	25	3.75	19	16	0.4	4.5	0.2	0.4	1 900	16

*1 Please refer to Specification Sheets for model numbers approved by safety standards.
*2 Optionally available.

PC400J00000F
(Mini-flat 5-pin)

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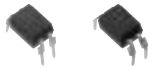
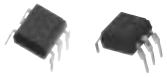
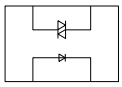
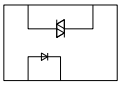
■Phototriac Coupler Lineup

Package	Applied voltage	ON-state current (rms)	Features		Model No.	Page
Mini-flat (SMD)	AC 200 V lines (V_{DRM} = 600V)	0.05 A	General purpose		S2S3A00F*3 / S2S5A00F*3 / S2S5FA0F*3	20
				Built-in zero-cross circuit	S2S4A00F*3	21
DIP type	AC 200 V lines (V_{DRM} = 600V)	0.1 A				
(4-pin) 			Reinforced isolation		PC3SH11YFZAH*3 / PC3SH13YFZAH*3	20
				Built-in zero-cross circuit	PC3SH21YFZBH*2	21
DIP type	AC 200 V lines (V_{DRM} = 600V)	0.1 A	General purpose		PC3SD12NTZAH*3 / PC3SD11YTZCH*1 / PC3SD11NTZCH*1	20
(6-pin package, 5th-pin cut) 				Built-in zero-cross circuit	PC3SD21NTZAH*3 / PC3SD21NTZBH*2 / PC3SD21NTZDH*4	21
			Reinforced isolation		PC3SF11YVZAH*3 / PC3SF11YVZBH*2	20
				Built-in zero-cross circuit	PC3SF21YVZAH*3 / PC3SF21YVZBH*2	21
	AC 200 V lines (V_{DRM} = 800V)	0.1 A	General purpose		PC4SD11NTZCH*1	20
				Built-in zero-cross circuit	PC4SD21NTZCH*1 / PC4SD21NTZDH*4	21
			Reinforced isolation		PC4SF11YTZBH*2	20
				Built-in zero-cross circuit	PC4SF21YVZBH*2 / PC4SF21YWPSH*2	21

Minimum trigger current: *1 $I_{FT} \leqq$ 5 mA, *2 $I_{FT} \leqq$ 7 mA, *3 $I_{FT} \leqq$ 10 mA, *4 $I_{FT} \leqq$ 3 mA

■Phototriac Couplers

○: Approved
△: Please confirm with our sales representatives. (Ta = 25°C)

Model No.	Internal connection diagram	Features	Approved by safety standards*3			Package	Absolute maximum ratings			Electro-optical characteristics
			UL, CSA	VDE	BSI, SEMKO, DEMKO, FIMKO		ON-state current IT (rms) (A)	Repetitive peak OFF-state voltage VDRM (V)	Isolation voltage (AC) Viso (rms) (kV)	Min. trigger current IFT (mA) MAX. VD = 6 V, RL = 100Ω
S2S3A00F		200 V lines, compact	○	○*4	–	Mini-flat 4-pin	0.05	600	3.75	10
S2S5A00F		200 V lines, compact	○	○*4	–					10
S2S5FA0F		High impulse noise product	○	○*4	–					10
PC3SH11YFZAH		200 V lines, compact, reinforced isolation	△	△	△	4-pin DIP	0.1		5.0	10
PC3SH13YFZAH		200 V lines, compact, reinforced isolation, high noise resistance	△	△	△					10
PC3SD12NTZAH		200 V lines	△	△*4	–	6-pin DIP*2	0.1	600	5.0	10
PC3SD11YTZCH		200 V lines	△	△*4	–	6-pin DIP*1, *2				5
PC3SD11NTZCH		200 V lines	△	△*4	–	6-pin DIP*2		600		5
PC4SD11NTZCH		200 V lines, repetitive peak-OFF-state voltage	△	△*4	–	6-pin DIP*1, *2		800		5
PC3SF11YVZAH		200 V lines, reinforced isolation	△	△	△	6-pin DIP*2		600		10
PC3SF11YVZBH		200 V lines, reinforced isolation	△	△	△	6-pin DIP*1, *2				7
PC4SF11YTZBH		200 V lines, reinforced isolation, repetitive peak-OFF-state voltage	△	△	△	6-pin DIP*2		800		7

*1 Lead forming type is also available for surface mounting.
*2 These are 5th-pin cut type.
*3 Please refer to Specification Sheets for model numbers approved by safety standards.
*4 Optionally available.

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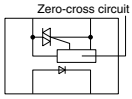
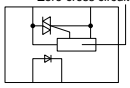
■Phototriac Couplers

<Built-in zero-cross circuit type>

○: Approved
△: Please confirm with our sales representatives. (Ta = 25°C)

Model No.	Internal connection diagram	Features	Approved by safety standards*3			Package	Absolute maximum ratings			Electro-optical characteristics
			UL, CSA	VDE	BSI, SEMKO, DEMKO, FIMKO		ON-state current IT (rms) (A)	Repetitive peak OFF-state VDRM (V)	Isolation voltage (AC) Viso (rms) (kV)	Min. trigger current IFT (mA) MAX. VD = 4 V, RL = 100Ω
S2S4A00F		200 V lines, compact	○	○*4	–	Mini-flat 4-pin	0.05	600	3.75	10*1
PC3SH21YFZBH		200 V lines, compact, reinforced isolation	△	△	△	4-pin DIP	0.1	600	5.0	7
PC3SD21NTZAH		200 V lines, low zero-cross voltage: MAX. 20 V	△	–	–	6-pin DIP*2	0.1	600	5.0	10
PC3SD21NTZBH		200 V lines, low zero-cross voltage: MAX. 20 V	△	△*4	–					7
PC3SD21NTZDH		200 V lines, low zero-cross voltage: MAX. 20 V	△	–	–					3
PC4SD21NTZCH		200 V lines, repetitive peak-OFF-state voltage	△	–	–			800		5
PC4SD21NTZDH		200 V lines, repetitive peak-OFF-state voltage	△	–	–					3
PC3SF21YVZAH		200 V lines, reinforced isolation	△	△	△			600		10
PC3SF21YVZBH		200 V lines, reinforced isolation	△	△	△					7
PC4SF21YVZBH		200 V lines, reinforced isolation, repetitive peak-OFF-state voltage	△	△	△			800		7
PC4SF21YWPSH		High impulse noise product	△	△	△					7

*1 VD = 6 V, RL = 100Ω
*2 These are 5th-pin cut type.
*3 Please refer to Specification Sheets for model numbers approved by safety standards.
*4 Optionally available.


S2S3A00F
(Mini-flat 4-pin)


PC3SH series
(4-pin DIP)


PC3SD series,
PC4SD series
(6-pin DIP)


PC3SF series,
PC4SF series
(6-pin DIP)

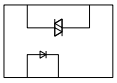
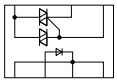
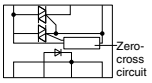
■Solid State Relay Lineup

Package	Applied voltage	ON-state current (rms)	Features	Model No.	Page
DIP 6-pin	AC 200 V lines	0.06 A	General purpose	PR31MA11NTZH	23
		0.15 A	General purpose	PR32MA11NTZH	23
DIP 8-pin	AC 200 V lines	0.3/0.6/0.9/1.2 A	General purpose	PR33MF5 series / PR39MF5 series / PR36MF5 series / PR3BMF5 series	23
		0.6/0.9 A	Built-in zero-cross circuit	PR36MF2 series / PR39MF2 series	23

■Solid State Relays

<DIP type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Approved by safety standards*1			Package	Absolute maximum ratings			Electrical characteristics
			UL	CSA	VDE*2		ON-state current IT (rms) (A)	Repetitive peak OFF-state voltage VDRM (V)	Isolation voltage (AC) Viso (rms) (kV)	Min. trigger current IFT (mA) MAX. VD = 6 V, RL = 100Ω
PR31MA11NTZH		200 V lines, compact	△	△	△	6-pin DIP	0.06	600	5.0	10
PR32MA11NTZH		200 V lines, 150 mA model in a small package	△	△	△		0.15			10
PR33MF51NSLH		200 V lines, compact	△	△	△	8-pin DIP	0.3	600	4.0	10
PR33MF52NSLH		200 V lines, compact	△	△	△					10
PR36MF51NSLH		200 V lines, compact	△	△	△		0.6			10
PR39MF51NSLH		200 V lines, compact	△	△	△		0.9			10
PR3BMF51NSLH		200 V lines, compact	△	△	△		1.2			10
PR36MF21NSZH		200 V lines, compact (built-in zero-cross circuit)	△	△	△		0.6	600		10
PR36MF22NSZH		200 V lines, compact (built-in zero-cross circuit), low input current	△	△	△					5
PR39MF22NSZH		200 V lines, compact (built-in zero-cross circuit), low input current	△	△	△		0.9			5

Note: Please confirm with our sales representatives concerning inquiries related to acquisition of international safety standard compliance certification.
*1 Please refer to Specification Sheets for model numbers approved by safety standards.
*2 Optionally available.


PR31MA11NTZH
(6-pin DIP)


PR36MF21NSZH
(8-pin DIP)

☆New product
★Under development

RoHS

■Photointerrupter Lineup

<Transmissive type>

Output type	Package type	Outline	Mounting method	Model No. (series)	Page
Single phototransistor	Compact		PWB mounting type	GP1S396HCP0F / GP1S09xHCZ0F / GP1S19xHCZ0F	25
			Surface-mount type	GP1S396HCPSF / GP1S296HCPSF / GP1S092HCPIF / GP1S19xHCxSF	25
	Case type		PWB mounting type	GP1S5x series	26
	With connector	Horizontal slit	PWB mounting type	GP1S59J0000F▲	26
		General purpose	Snap-in	GP1S173LCS2F / GP1S273LCS1F	26
Digital output	Compact	High resolution	PWB mounting type	★GP1A396HCP0F	27
(OPIC output)			Surface-mount type	★GP1A396HCPSF	27
	Case type		PWB mounting type	GP1A5x series	27
		Wide gap	PWB mounting type	GP1A57HRJ00F	27
	With connector	General purpose	Snap-in	GP1A173LCS3F / GP1A173LCSVF▲ ☆GP1A173LCS5F	28

<Reflective type>

Output type	Package type	Outline	Mounting method	Model No. (series)	Page
Single phototransistor	Leadless	Long focal distance	Surface-mount type	GP2S700HCP	28
High response speed	Compact, thin (leadless)	General purpose	Surface-mount type	GP2S60	28
OPIC output	With connector	Light modulation type, Sensitivity adjusted	Screw mounting type/ Compact snap-in/ Inverter light countermeasures	GP2A25 series / GP2A28 series / GP2A200LCS0F / GP2A230LRS0F / GP2A230LRSAF / ☆GP2A430LCSAF / GP2A240LCS0F / GP2A250LCS0F	29

The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

RoHS

■Photointerrupters

<Transmissive type>

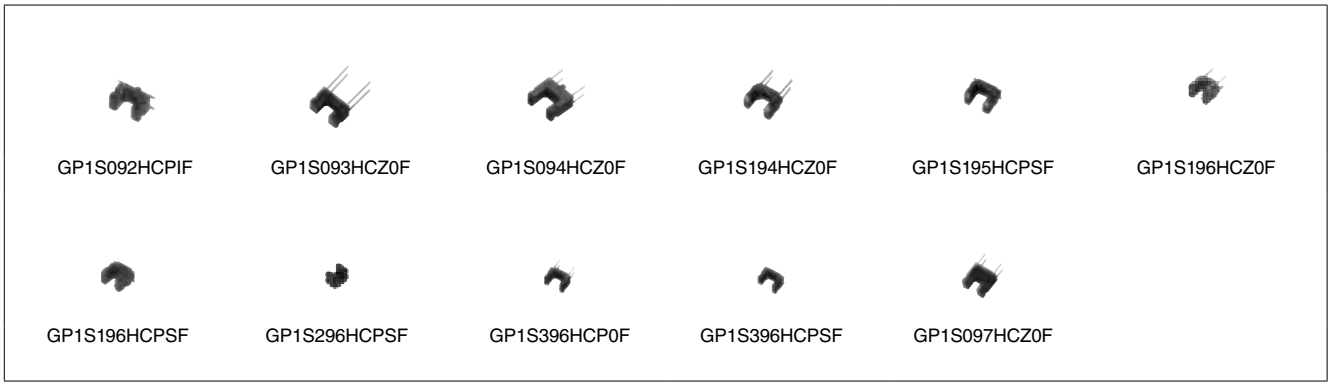
◆Single Phototransistor Output

<Compact type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	I_F (mA)	V_{CE} (V)	tr (μs) TYP.	I_C (mA)	R_L (kΩ)	V_{CE} (V)
GP1S092HCPIF		Wide gap, for soldering reflow, surface mount compatible, with positioning boss (4.5 × 2.6 × 2.9 [height] mm)	2.0	0.3	2.0	5	5	50	0.1	1	5
GP1S093HCZ0F		Wide gap (4.5 × 2.6 × 2.9 [height] mm)	2.0	0.3	2.0	5	5	50	0.1	1	5
GP1S094HCZ0F		Wide gap, with positioning pin, (5.5 × 2.6 × 4.8 [height] mm)	3.0	0.3	0.8	5	5	50	0.1	1	5
GP1S194HCZ0F		Compact, wide gap, size: 3.6 × 2.0 × 2.7 (height) mm	1.7	0.3	3.0	5	5	50	0.1	1	5
GP1S195HCPSF		Compact, wide gap, surface mount compatible, size: 3.4 × 2.0 × 2.7 (height) mm	1.5	0.3	3.0	5	5	50	0.1	1	5
GP1S196HCZ0F		Compact, low profile (3.1 × 2.0 × 2.7 [height] mm)	1.1	0.3	2.0	5	5	50	0.1	1	5
GP1S196HCPSF		Surface mount, for soldering reflow, compact, low profile (3.1 × 2.0 × 2.7 [height] mm)	1.1	0.3	2.0	5	5	50	0.1	1	5
GP1S296HCPSF		Surface mount, for soldering reflow, compact, low profile (2.5 × 1.8 × 1.9 [height] mm)	1.0	0.2	3.0	5	5	50	0.1	1	5
GP1S396HCP0F		Straight lead type, compact, low profile (2.26 × 1.4 × 1.6 [height] mm)	1.2	0.12	2.0	5	5	30	0.1	1	5
GP1S396HCPSF		Surface mount, for soldering reflow, compact, low profile (2.26 × 1.4 × 1.6 [height] mm)	1.2	0.12	2.0	5	5	30	0.1	1	5
GP1S097HCZ0F		High resolution, wide gap, with mounting hole (4.5 × 2.6 × 4.5 [height] mm)	2.0	0.3	2.0	5	5	50	0.1	1	5

Note: Topr: –25 to +85°C
GP1SxxxHCZxF: Sleeve package, GP1SxxxHCPxF: Taped package

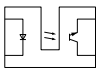


PHOTOINTERRUPTERS (TRANSMISSIVE TYPE)

RoHS

<Case type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	I_F (mA)	V_{CE} (V)	tr (μs) TYP.	I_C (mA)	R_L (Ω)	V_{CE} (V)
GP1S50J0000F		High resolution, both-side mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S51VJ000F		High resolution, side mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S52VJ000F		High resolution, PWB mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S53VJ000F		High resolution, PWB mounting type	5.0	0.5	2.5	20	5	3	2	100	2
GP1S56TJ000F▲		High resolution, with positioning pin, PWB mounting type	2.0	0.15	2.0	20	5	38	0.5	1 000	2
GP1S58VJ000F		High resolution, with positioning pin, PWB mounting type	5.0	0.5	2.5	20	5	3	2	100	2
GP1S59J0000F▲		High resolution, horizontal slit, with positioning pin, PWB mounting type	4.2	0.5	2.5	20	5	3	2	100	2

Note: Topr: –25 to +85°C
The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.


GP1S50J0000F


GP1S51VJ000F


GP1S52VJ000F


GP1S53VJ000F


GP1S56TJ000F▲


GP1S58VJ000F


GP1S59J0000F▲

<With connector>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	I_F (mA)	V_{CE} (V)	tr (μs) TYP.	I_C (mA)	R_L (Ω)	V_{CE} (V)
GP1S173LCS2F		Snap-in mounting integrated connector type Applicable to 3 kinds of thickness of mounting boards	5.0	0.5	2.5	20	5	3	2	100	2
GP1S273LCS1F		Snap-in mounting integrated connector type Applicable to 3 kinds of thickness of mounting boards Compact (Compatible with 1.5 mm pitch connector)	5.0	0.7	2.5	20	5	3	2	100	2

Note: Topr: –30 to +95°C


GP1S173LCS2F


GP1S273LCS1F

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*RoHS Directive: Prohibits use of lead, cadmium, hexavalent chromium, mercury and specific brominated flame retardants (PBBs and PBDEs), with certain exceptions.
Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

★Under development

◆OPIC Type

("OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

<Compact type>

(Ta = 25°C)

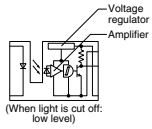
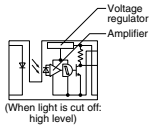
Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics								
					Threshold input current				Propagation delay time				
					I_{FLH} (mA) MAX.	I_{FHL} (mA) MAX.	V_{CC} (V)	R_L (kΩ)	t_{PLH} (µs) TYP.	t_{PHL} (µs) TYP.	I_F (mA)	R_L (kΩ)	V_{CC} (V)
★GP1A396HCP0F		Compact, high response speed, digital output, PWB mounting	1.2	0.12	2.85	–	2.5 to 5.5	24 to 30	15	15	5	24	3.3
★GP1A396HCPSF		Compact, high response speed, digital output, surface mount	1.2	0.12	2.85	–	2.5 to 5.5	24 to 30	15	15	5	24	3.3

Note: Topr = –25 to +85°C

GP1A396HCP0F GP1A396HCPSF

<Case type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics							
					Threshold input current			Propagation delay time				
					I_{FLH} (mA) MAX.	I_{FHL} (mA) MAX.	V_{CC} (V)	t_{PLH} (µs) TYP.	t_{PHL} (µs) TYP.	I_F (mA)	R_L (Ω)	V_{CC} (V)
GP1A50HRJ00F		Both-side mounting, with screw hole	3.0	0.5	5	–	5	3	5	5	280	5
GP1A51HRJ00F		Side mounting, with screw hole	3.0	0.5	5	–	5	3	5	5	280	5
GP1A52HRJ00F		PWB mounting type	3.0	0.5	5	–	5	3	5	5	280	5
GP1A53HRJ00F		PWB mounting type	5.0	0.5	8	–	5	3	5	8	280	5
GP1A57HRJ00F		PWB mounting type, with positioning pin	10.0	1.8	7	–	5	3	5	7	280	5
GP1A58HRJ00F		PWB mounting type, with positioning pin	5.0	0.5	8	–	5	3	5	8	280	5
GP1A52LRJ00F		PWB mounting type	3.0	0.5	–	5	5	5	3	5	280	5

Note: Topr = –25 to +85°C

GP1A50HRJ00F GP1A51HRJ00F GP1A52LRJ00F (GP1A52HRJ00F) GP1A53HRJ00F (GP1A58HRJ00F with positioning pin) GP1A57HRJ00F

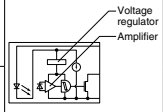
☆New product

◆OPIC Type

("OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

<With 3-pin connector terminal>

(Ta = 25°C)

Model No.	Internal connection diagram	Features		Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics					
						Supply voltage Vcc (V)		Low level output voltage			
						MIN.	MAX.	VOL (V) MAX.	Light cut-off	IOL (mA)	Vcc (V)
GP1A173LCS3F		with 3-pin connector	Snap-in mounting integrated connector type*1 3.3 V / 5 V operation	5.0	0.5	2.7	5.5	0.35	No	4	3.3 5.0
GP1A173LCSVF▲			Snap-in mounting integrated connector type*1 enforced electrostatic discharge (ESD)	5.0	0.5	4.5	5.5	0.35	No	4	5.0
☆GP1A173LCS5F			Snap-in mounting integrated connector type*1 3.3 V / 5 V operation enforced electrostatic discharge (ESD) increased power line noise tolerance	5.0	0.5	3.0	5.5	0.35	No	4	3.3 5.0

Note: Topr: –30 to +95°C
*1 Applicable to 3 kinds of thickness of mounting boards.
The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

GP1A173LCS3F
GP1A173LCSVF▲
GP1A173LCS5F

■Photointerrupters

<Reflective type>

◆Single Phototransistor Output

<Compact>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Optimum detecting distance (mm)	Electro-optical characteristics						
				Current transfer ratio			Response time			
				CTR (%) MIN.	IF (mA)	VCE (V)	tr (µs) TYP.	IC (mA)	RL (kΩ)	VCE (V)
GP2S700HCP		Compact (4 × 3 × 2 [height] mm), long focal distance, surface mounting leadless type	4	1.5	4	2	20	0.1	1	2
GP2S60		Thin (3.2 × 1.7 × 1.1 [height] mm), surface mounting leadless type	1	1.0	4	2	20	0.1	1	2

Note: Topr: –25 to +85°C

GP2S700HCP GP2S60

☆New product

RoHS

◆OPIC Output

("OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

<With 3-pin connector terminal>

(Ta = 25°C)

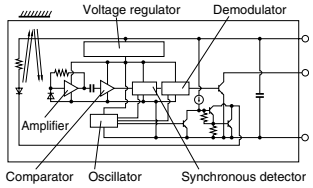
Model No.	Internal connection diagram	Features	Optimum detecting distance (mm)	Electro-optical characteristics					
				Supply voltage Vcc (V)		Dissipation current		Low level output voltage	
				MIN.	MAX.	Icc (mA) MAX.	Vcc (V)	VOL (V) MAX.	Vcc (V)
GP2A200LCS0F	(Following diagram [A])	Multiple types of paper detectable, light modulation type, with connector, sensitivity adjusted	5 to 15	4.75	5.25	30*1	5	0.4	5
GP2A240LCS0F		Applicable to inverter fluorescent lamp, light modulation type, with connector, sensitivity adjusted	5 to 15	4.75	5.25	30*1	5	0.4	5
GP2A250LCS0F		Static electricity resistant, applicable to inverter fluorescent lamp, light modulation type, with connector, sensitivity adjusted	2.5 to 12.5	4.75	5.25	30*1	5	0.4	5
GP2A25J0000F		Multiple types of paper detectable, light modulation type, with connector, sensitivity adjusted	3 to 7	4.75	5.25	30*1	5	0.4	5
GP2A230LRS0F	(Following diagram [B])	Compact, screw-clamp type, multiple types of paper detectable, light modulation type, with connector	3 to 7	4.75	5.25	20*1	5	0.4	5
GP2A230LRSAF		Compact, hook type, multiple types of paper detectable, light modulation type, with connector							
☆GP2A430LCSAF	(Following diagram [C])	Compact, hook type, multiple types of paper detectable, light modulation type, with connector		3.0	5.5	10*1	3.3 to 5	0.4	3.3 to 5
GP2A25NJJ00F	(Following diagram [A])	Multiple types of paper detectable, light modulation type, sensitivity adjusted, improved light-resistance characteristic for inverter lighting, built-in visible light cut filter	3 to 7	4.75	5.25	30*1	5	0.4	5
GP2A25DJ000F		Multiple types of paper detectable, light modulation type, with connector, sensitivity adjusted	3 to 7	4.75	5.25	30*1	5	0.4	5
GP2A28AJ000F		Multiple types of paper detectable, light modulation type, with connector, sensitivity adjusted, hook type	3 to 7	4.75	5.25	30*1	5	0.4	5

Note: Topr: –10 to +60°C (GP2A25J0000F, etc.)
–10 to +70°C (GP2A200LCS0F, GP2A240LCS0F, GP2A250LCS0F, GP2A230LRS0F, GP2A230LRSAF, GP2A430LCSAF)

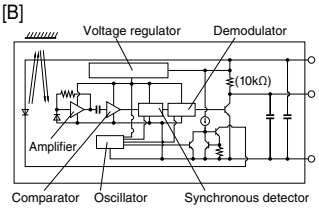
*1 Smoothing value $R_L = \infty$

[Internal connection diagram]

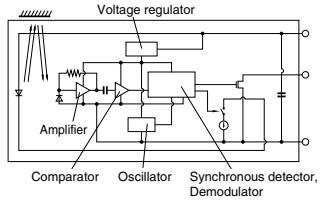
[A]



[B]



[C]



GP2A25J0000F
(GP2A25NJJ00F, GP2A200LCS0F, GP2A240LCS0F)

GP2A250LCS0F

GP2A25DJ000F

GP2A230LRS0F

GP2A230LRSAF
(GP2A430LCSAF)

GP2A28AJ000F

Optoelectronics

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☆New product

■Proximity Sensor

(Ta = 25°C)

Model No.	Features	Absolute maximum ratings		Electro-optical characteristics			
		V_{CC} (V)	Topr (°C)	Dissipation current I_{CC} (μA) TYP.	Detecting distance Lon (mm) MIN.	Non-detecting distance Loff (mm) MAX.	Peak emission wavelength λp (nm)
GP2AP002S30F	Compact size (4.0 × 2.0 × 1.25 t mm) Drastically reduced LED current consumption by employing a light modulation system Built-in LEDs for simple optical design and I²C output (LED emission duty: MAX. 0.3%)	3.8	–25 to +85	240	25	150	940

GP2AP002S30F

■Proximity Sensor with Integrated Ambient Light Sensor

(Ta = 25°C)

Model No.	Features	Absolute maximum ratings		Electro-optical characteristics					
					Proximity sensor portion		Ambient light sensor portion		
		V_{CC} (V)	Topr (°C)	Dissipation current Icc (μA) TYP.	Detecting distance Lon (mm) TYP.	Peak emission wavelength λp (nm)	Recommended illuminance range Ev (lx)	Output resolution (bit)	ADC conversion time Tint (ms) TYP.
GP2AP030A00F	LED and ambient light sensor combined in a single package (4.0 × 2.1 × 1.25 t mm) Built-in LEDs for simple optical design Illuminance output: digital 16-bit output (Minimum detectable illuminance: 0.02 lx) I²C output compatible (proximity sensor, ambient light sensor)	5.5	–35 to +85	65	100	940	0.02 to 10 000	16	100
☆GP2AP007A00F	LED and ambient light sensor combined in a single package (2.5 × 2.0 × 1.0 t mm) Compact with reduced mounting area Illuminance output: digital 16-bit output (Minimum detectable illuminance: 0.1 lx) Small aperture compatible I²C output compatible (proximity sensor, ambient light sensor)	2.2 to 5.5	–30 to +85	100	100	940	0.1 to 100 000	16	30
☆GP2AP008T00F	LED and ambient light sensor combined in a single package (3.94 × 2.36 × 1.35 t mm) Illuminance output: digital 16-bit output (Minimum detectable illuminance: 0.1 lx) Small aperture compatible I²C output compatible (proximity sensor, ambient light sensor)	2.2 to 5.5	–30 to +85	100	100	940	0.1 to 100 000	16	30

GP2AP030A00F

GP2AP007A00F

GP2AP008T00F

RoHS

■Proximity/Gesture Sensor with Integrated Ambient Light Sensor

(Ta = 25°C)

Model No.	Features	Absolute maximum ratings		Electro-optical characteristics						
						Proximity/gesture sensor portion		Ambient light sensor portion		
		V_{CC} (V)	Topr (°C)	Dissipation current Icc (μA) TYP.	Dissipation current Icc (Gesture) (μA) TYP.	Detecting distance Lon (mm) TYP.	Peak emission wavelength λp (nm)	Recommended illuminance range Ev (lx)	Output resolution (bit)	ADC conversion time Tint (ms) TYP.
GP2AP054A00F	LED and ambient light sensor combined in a single package (4.0 × 2.1 × 1.25 t mm) Simultaneous operation of the gesture recognition and illuminance functions is possible Low power consumption mode is available for the proximity sensor Capable of holding a total of 4 gesture detection results	5.5	–35 to +85	100	320	100	940	0.02 to 10 000	16	30

GP2AP054A00F

■UV Light Sensors

(Ta = 25°C)

Model No.	Features	Absolute maximum ratings			Electro-optical characteristics				
		V_{CC} (V)	I^2C voltage VI^2C (V)	Topr (°C)	Dissipation current Icc (μA) TYP.	Built-in clock frequency fosc (MHz) TYP.	Output resolution (bit)	ADC conversion time (ms) TYP.	Recommended illuminance range Ev (lx) Sunlight (AM1.5 equivalent)
GA1AUV100WP	Detects only UV rays contained within sunlight (no sensitivity to visible light) Built-in ambient light sensor Compact size: 2.0 × 1.6 × 0.6 t mm I^2C output compatible	2.2 to 5.5	1.7 to Vcc	–35 to +85	65	2.62	16	25	UV: 0 to 200 000 Illuminance: 0 to 120 000

GA1AUV100WP

■OPIC Light Detectors

("OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

(Ta = 25°C)

Model No.	Type	Package	Absolute maximum ratings				Electro-optical characteristics							
			V_{CC} (V)	P (mW)	I_O (mA)	Topr (°C)	E_{VLH} (lx) MAX.	E_{VHL} (lx) MAX.	V_{CC} (V)	t_{PLH} (µs) TYP.	t_{PHL} (µs) TYP.	V_{CC} (V)	E_V (lx)	R_L (Ω)
IS485E	Built-in schmidt trigger circuit, amplifier and voltage regulator	Transparent epoxy resin with condenser (lens)	−0.5 to +17	175	50	−25 to +85	–	35	5	5	3	5	50	280
IS486E			−0.5 to +17	175	50	−25 to +85	35	–	5	3	5	5	50	280

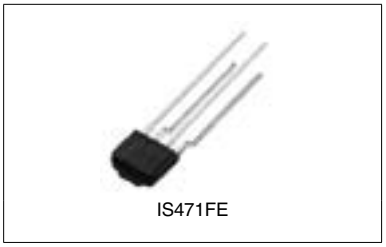
IS485E
(IS486E)

<Model employing a light modulation system>

(Ta = 25°C)

Model No.	Type	Package	Absolute maximum ratings				Electro-optical characteristics*2						External disturbing light illuminance E_{VDX}(lx) TYP.
			V_{CC} (V)	P (mW)	I_O (mA)	Topr (°C)	V_{OL} (V) MAX.	V_{OH} (V) MIN.	t_{PLH} (µs) TYP.	t_{PHL} (µs) TYP.	V_{CC} (V)	R_L (Ω)	
IS471FE*1, *3	Built-in pulse driver circuit at the emitter side, synchronous detector circuit, amplifier circuit and demodulator circuit	Visible light cut-off epoxy resin	−0.5 to +16	250	50	−25 to +60	0.35	4.97	400	400	5	280	7 000

*1 IS471FE is less susceptible to disturbing effects thanks to the light modulation system
*2 V_{CC} = 5 V
*3 Straight lead type (IS471FSE) is also available.



IS471FE

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RoHS

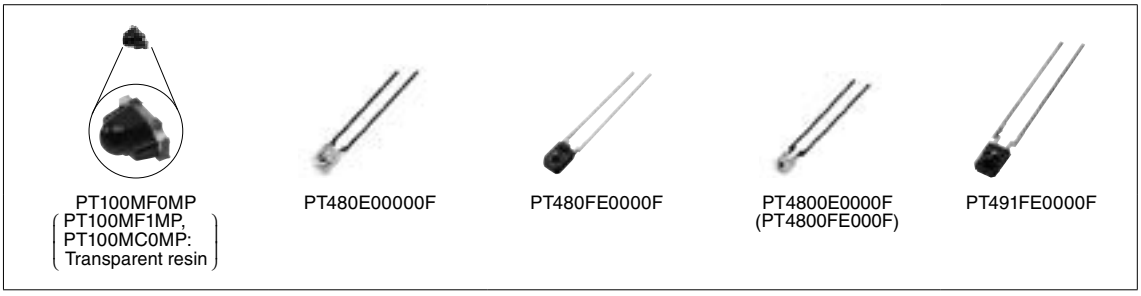
■Phototransistor Lineup

Package	Output type	Features	Half sensitivity angle	Model No.	
				Standard	Visible light cut-off
Epoxy resin with lens	Single phototransistor	General purpose/Narrow acceptance	±13°	PT480E00000F	PT480FE0000F
Surface mounting leadless type	Darlington phototransistor	Compact, thin	±35°	PT4800E0000F	PT4800FE000F
		High sensitivity/Intermediate acceptance	±40°	—	PT491FE0000F
	Single phototransistor	Compact (side view/top view mounting possible)	±15°	PT100MC0MP	PT100MF0MP
	Darlington phototransistor	Compact (side view/top view mounting possible)	±15°	—	PT100MF1MP

■Phototransistors

Type	Model No.	Package	Absolute maximum ratings			Ic (mA)				I_{CEO}(A)		$\Delta\theta$ (°)	λp (nm)
			V_{CEO} (V)	P_C (mW)	Topr (°C)	MIN.	MAX.	V_{CE} (V)	Ee (mW/cm²)	MAX.	V_{CE} (V)	TYP.	TYP.
Single	PT100MC0MP	Surface mounting leadless type with lens	35	75	−30 to +85	1.7	5.1	5	1	1×10^{-7}	20	±15	900
	PT100MF0MP*1		35	75	−30 to +85	1.15	3.45	5	1	1×10^{-7}	20	±15	910
	PT480E00000F	Epoxy resin with lens	35	75	−25 to +85	0.4	TYP. 1.7	5	1	1×10^{-7}	20	±13	800
	PT480FE0000F*1		35	75	−25 to +85	0.25	TYP. 0.8	5	1	1×10^{-7}	20	±13	860
	PT4800E0000F		35	75	−25 to +85	0.12	TYP. 0.4	5	1	1×10^{-7}	20	±35	800
	PT4800FE000F*1		35	75	−25 to +85	0.08	TYP. 0.25	5	1	1×10^{-7}	20	±35	860
Darlington	PT491FE0000F*1	Epoxy resin with lens	35	75	−25 to +85	0.2	0.8	2	Ev, 2 lx	1×10^{-6}	10	±40	860
	PT100MF1MP*1	Surface mounting leadless type with lens	35	75	−30 to +85	0.2	1.2	5	0.01	1×10^{-6}	10	±15	860

*1 Visible light cut-off type



PT100MF0MP (PT100MF1MP, PT100MC0MP: Transparent resin)

PT480E00000F

PT480FE0000F

PT4800E0000F (PT4800FE000F)

PT491FE0000F

Optoelectronics

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RoHS

■PIN Photodiodes

(Ta = 25°C)

Model No.	Features	Package (Material)	Active area (mm^2)	Topr (°C)	Isc (μA) MIN.	Ev (lx)	Id (A) MAX.	V_R (V)	tr, tf (μs) TYP.	V_R (V)	R_L (kΩ)	λp (nm) TYP.
PD410PI2E00F	PIN type	Visible light cut-off epoxy resin with condenser (lens)	3.31	–25 to +85	2.5	100	1×10^{-8}	10	0.2	10	1	1 000
PD411PI2E00F		Transparent epoxy resin with condenser (lens)	3.31	–25 to +85	5.0	100	1×10^{-8}	10	0.2	10	1	960
PD413PI2E00F	PIN type IrDA1.0	Visible light cut-off epoxy resin with condenser (lens)	3.31	–25 to +85	MIN. 4.5 (TYP. 5.4)	100	1×10^{-8}	10	0.2	10	1	960
PD100MC0MP	Surface mounting leadless type	Transparent epoxy resin board with lens	–	–30 to +85	0.6	100	1×10^{-8}	10	0.01	15	0.18	820
PD100MF0MP	Surface mounting leadless type	Visible light cut-off epoxy resin board with lens	–	–30 to +85	0.4	100	1×10^{-8}	10	0.01	15	0.18	850

PD410PI2E00F
(PD411PI2E00F: transparent;
PD413PI2E00F)

PD100MC0MP
(PD100MF0MP: black)

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RoHS

■Infrared Emitting Diode Lineup

Type	Package	Features	Half intensity angle	Model No.
Single-end lead	Epoxy resin with lens	General purpose/Narrow beam angle	±13°	GL480E00000F
(Side view type)		Compact and thin	±30°	GL4800E0000F
Surface mount type	Epoxy resin with lens/ leadless	Compact/Narrow beam angle	±10°	GL100MN0MP
	(Mountable for Top view/ Side view type)	High output type	±10°	GL100MN1MP
		Compact/Wide beam angle	±80°	GL100MD1MP1

■Infrared Emitting Diodes

(Ta = 25°C)

Model No.	Package, features	Absolute maximum ratings				Radiant flux Φe (mW)			VF (V)			Δθ (°)	λp (nm)
		IF (mA)	VR (V)	P (mW)	Topr (°C)	MIN.	TYP.	IF (mA)	TYP.	MAX.	IF (mA)	TYP.	TYP.
GL480E00000F	Epoxy resin with lens	50	6	75	−25 to +85	0.7	–	20	1.2	1.4	20	±13	950
GL4800E0000F		50	6	75	−25 to +85	0.7	1.6	20	1.2	1.4	20	±30	950
GL100MN0MP	Surface mounting leadless type, epoxy resin board with lens	50	6	75	−30 to +85	1.0	3.0 (MAX.)	20	1.2	1.4	20	±10	940
GL100MN1MP	Surface mounting leadless type, epoxy resin board with lens, high output type	50	6	75	−30 to +85	2.0	6.0 (MAX.)	20	1.2	1.5	20	±10	940
GL100MD1MP1	Surface mounting leadless type, epoxy resin board with lens, wide beam angle	50	6	75	−30 to +85	–	6.0 (MAX.)	20	–	1.5	20	±80	940

GL480E00000F

GL4800E0000F

GL100MN0MP
(GL100MN1MP, GL100MD1MP1)

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★Under development

■Distance Measuring Sensor Lineup

Sensor type	Output	Detected distance	Features	Model No.	Page
PSD, 2PD	1-bit digital output according to distance measuring	5 cm	Battery drive compatible, compact, 1-bit digital output	GP2Y0D805Z0F	37
		10 cm	Battery drive compatible, compact, 1-bit digital output	GP2Y0D810Z0F	37
		15 cm	Battery drive compatible, compact, 1-bit digital output	GP2Y0D815Z0F	37
		13 cm	1-bit digital output	GP2Y0D413K0F	37
		24 cm	1-bit digital output	GP2Y0D21YK0F	37
		80 cm	1-bit digital output	GP2Y0D02YK0F	37
	Analog voltage output according to distance measuring	1.5 to 15 cm	Analog output	GP2Y0AF15 series	38
		2 to 15 cm	Analog output	GP2Y0A51SK0F	38
		4 to 30 cm	Analog output	GP2Y0A41SK0F / GP2Y0AF30 series	38
		10 to 80 cm	Analog output	GP2Y0A21YK0F	38
		10 to 150 cm	Compact (22 × 8 × 7.2 [T] mm), Analog output	GP2Y0A60SZLF	38
		20 to 150 cm	Analog output	GP2Y0A02YK0F	38
		100 to 550 cm	Analog output	GP2Y0A710K0F	38
CMOS	Analog voltage output according to distance measuring (Including I²C output)	4 to 50 cm	Compact size, high-precision measurement / Analog output	GP2Y0E02A	39
			I²C output	GP2Y0E02B	39
			Analog, I²C output	GP2Y0E03	39
ToF	I²C output	10 to 120 cm	Compact size, high-precision measurement / IR laser	GP2AP01VTx0F	39

■Dust Sensor Unit Lineup

Output	Features	Model No.	Page
Analog output	Pulse analog output, single-shot detection of house dust, general purpose	GP2Y1010AU0F	40
	Pulse analog output, single-shot detection of house dust, high sensitivity	GP2Y1012AU0F	40
	Pulse analog output, single-shot detection of house dust, high precision	GP2Y1014AU0F	40
Digital output	Digital (PWM) output, built-in microprocessor controller, single-shot detection of house dust, high sensitivity	GP2Y1023AU0F	40
	Digital (UART) output, built-in microprocessor controller, single-shot detection of house dust, high concentration	★GP2Y1026AU0F	40
	Digital (UART) output, built-in microprocessor controller, sensing can discriminate between PM2.5 and PM10, internal cleaning possible	★GP2Y1030AU0F	40

RoHS

■Distance Measuring Sensors (1) PSD, 2PD Type

◆Digital Output

(Ta = 25°C)

Model No.	Detected distance (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1			
			Vcc (V)	Topr (°C)	VOH (V) MIN.	VOL (V) MAX.	Dissipation current	
							Operating (mA)	Standby (μA)
GP2Y0D805Z0F	5	Light detector (2PD), infrared LED and signal processing circuit, short distance measuring type, battery drive compatible (operating power supply: 2.7 to 6.2 V)	−0.3 to +7	−10 to +60	Vcc −0.6	0.6	MAX. 6.5	MAX. 8
GP2Y0D810Z0F	10	Light detector (2PD), infrared LED and signal processing circuit, short distance measuring type, battery drive compatible (operating power supply: 2.7 to 6.2 V)	−0.3 to +7	−10 to +60	Vcc −0.6	0.6	MAX. 6.5	MAX. 8
GP2Y0D815Z0F	15	Light detector (2PD), infrared LED and signal processing circuit, short distance measuring type, battery drive compatible (operating power supply: 2.7 to 6.2 V)	−0.3 to +7	−10 to +60	Vcc −0.6	0.6	MAX. 6.5	MAX. 8
GP2Y0D413K0F	13	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, digital voltage output according to the measured distance	−0.3 to +7	−10 to +60	Vcc −0.3	0.6	–	–
GP2Y0D21YK0F	24	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, digital voltage output according to the measured distance	−0.3 to +7	−10 to +60	Vcc −0.3	0.6	MAX. 40	–
GP2Y0D02YK0F	80	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type (No external control signal required), digital voltage output according to the measured distance	−0.3 to +7	−10 to +60	Vcc −0.3	0.6	MAX. 50	–

*1 Vcc = 5 V
*2 PSD: Position Sensitive Detector

RoHS

◆Analog Output

(Ta = 25°C)

Model No.	Distance measuring range (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1		
			Vcc (V)	Topr (°C)	VOH (V) MIN.	VOL (V) MAX.	Dissipation current Operating (mA)
GP2Y0AF15 series	1.5 to 15	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms), compact, lineup of various connector shapes	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 15 cm), ΔVO (TYP.) = 2.3 V (at L = 15 cm → 1.5 cm)		TYP. 17
GP2Y0A51SK0F	2 to 15	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms)	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 15 cm), ΔVO (TYP.) = 2.25 V (at L = 15 cm → 2 cm)		TYP. 12
GP2Y0AF30 series	4 to 30	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms), compact, lineup of various connector shapes	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 30 cm), ΔVO (TYP.) = 2.3 V (at L = 30 cm → 4 cm)		TYP. 17
GP2Y0A41SK0F	4 to 30	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms)	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 30 cm), ΔVO (TYP.) = 2.25 V (at L = 30 cm → 4 cm)		MAX. 22
GP2Y0A21YK0F	10 to 80	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, linear voltage output	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 80 cm), ΔVO (TYP.) = 1.9 V (at L: 80 cm → 10 cm)		MAX. 40
GP2Y0A60SZLF	10 to 150	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, compact type (22 x 8 x 7.2 mm), long distance measuring type (No external control signal required)	−0.3 to +5.5	−10 to +60	VO (TYP.) = 0.65 V *3 (at L = 150 cm), ΔVO (TYP.) = 3.0 V (at L = 150 cm → 20 cm)		MAX. 50
GP2Y0A02YK0F	20 to 150	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type (No external control signal required)	−0.3 to +7	−10 to +60	VO (TYP.) = 0.4 V (at L = 150 cm), ΔVO (TYP.) = 2.05 V (at L = 150 cm → 20 cm)		MAX. 50
GP2Y0A710K0F	100 to 550	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type (No external control signal required)	−0.3 to +7	−10 to +60	VO (TYP.) = 2.5 V (at L = 100 cm), ΔVO (TYP.) = 0.7 V (at L = 100 cm → 200 cm)		TYP. 30

*1 Vcc = 5 V
*2 PSD: Position Sensitive Detector
*3 When Vcc = 3 V: Vo (TYP.) = 0.35 V (at L = 150 cm); ΔVo (TYP.) = 1.6 V (at L = 150 cm → 20 cm)

★Under development

■Distance Measuring Sensors (2) CMOS Type

◆Analog Output (including I²C output)

(Ta = 25°C)

Model No.	Distance measuring range (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1		
			Vcc (V)	Topr (°C)	VOH (V) MIN.	VOL (V) MAX.	Dissipation current Operating (mA)
GP2Y0E02A	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (18.9 × 8 × 5.2 mm), high-precision measurement, analog output	−0.3 to +3.6	−10 to +60	VOUT (A) 1 = 0.3 to 0.8 V (at L = 50 cm), VOUT (A) 3 = 2.1 to 2.3 V (at L = 4 cm)		MAX. 36
GP2Y0E02B	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (18.9 × 8 × 5.2 mm), high-precision measurement, I²C output	−0.3 to +3.6	−10 to +60	D1 = 45 to 50 cm (at L = 50 cm), D3 = 3 to 5 cm (at L = 4 cm)		MAX. 36
GP2Y0E03	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (16.7 × 11 × 5.2 mm), high-precision measurement, analog / I²C output both compatible	−0.3 to +5.5	−10 to +60	VOUT (A) 1 = 0.3 to 0.8 V, D1 = 45 to 50 cm (at L = 50 cm), VOUT (A) 3 = 2.1 to 2.3 V, D3 = 3 to 5 cm (at L = 4 cm)		MAX. 36

*1 Vcc = 5 V


GP2Y0D805Z0F
(GP2Y0D810Z0F, GP2Y0D815Z0F)


GP2Y0E02A
(GP2Y0E02B)


GP2Y0E03


GP2Y0A60SZLF


GP2Y0AF15 series


GP2Y0AF30 series


GP2Y0A21YK0F
(GP2Y0D21YK0F, GP2Y0A41SK0F GP2Y0D413K0F: without mounting hole)


GP2Y0A51SK0F


GP2Y0D02YK0F
(GP2Y0A02YK0F)


GP2Y0A710K0F

■ToF Type Distance Measuring Sensor (ToF = Time of Flight)

(VDD = 2.8V, Ta = 25°C)

Model No.	Features	Absolute maximum ratings		Electro-optical characteristics					
		VDD (V)	Tstg (°C)	Dissipation current (VDD) ICC_VDD (mA) TYP.	Dissipation current (VCSEL) ICC_VCSEL (mA) TYP.	VCSEL Peak emission wavelength λp (nm)	Possible measuring distance (white paper) Rwhite (cm)	Measurement accuracy (white paper 120 cm) Racc (%)	Detection time Trange (msec)
★GP2AP01VTx0F	Ultra miniature integrated light detector: 4.4 × 2.4 × 1.0 mm High-speed distance measuring in dark places through employment of IR laser I²C interface	3.6	−40 to +85	10	20	940	10 to 120	4	33


GP2AP01VTx0F

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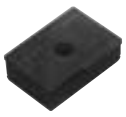
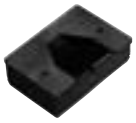
■Dust Sensor Unit

(Ta = 25°C)

Model No.	Features	Topr (°C)	Operating supply voltage (V)	Electro-optical characteristics			
				Dissipation current (mA)	Detection concentration μg/m³ (TYP.)	Sensitivity	Output
GP2Y1010AU0F	• Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Output: Analog voltage	–10 to +65	4.5 to 5.5	TYP. 11	0 to 600	0.5±0.15 V/ (0.1 mg/m³) Precision ±30%	Analog voltage
GP2Y1012AU0F	• High sensitivity • Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Output: Analog voltage				0 to 240	1.0±0.15 V/ (0.1 mg/m³) Precision ±15%	Analog voltage
GP2Y1014AU0F	• High precision • Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Output: Analog voltage				0 to 600	0.5±0.075 V/ (0.1 mg/m³) Precision ±15%	Analog voltage
GP2Y1023AU0F	• High sensitivity • Built-in microcomputer • Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Output: Digital signal output (PWM)		4.75 to 5.25	TYP. 15	0 to 240	1.4±0.15 ms/ (0.1 mg/m³) Precision ±15%	Digital signal (PWM) Temperature correction Averaging
★GP2Y1026AU0F	• High concentration • Built-in microcomputer • Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Output: Digital signal output (UART)				0 to 1 000	0.35±0.06 V/ (0.1 mg/m³) Precision ±15%	Digital signal (UART) Temperature correction Averaging
★GP2Y1030AU0F	• Built-in microcomputer • Built-in infrared emitting diode, photodiode and signal processing circuit • Compact, single-shot detection of house dust • Sensing can discriminate between PM2.5 and PM10 • Internal cleaning possible		3 to 5.5	TYP. 25	0 to 500	Precision ±15%	Digital signal (UART/I²C)



GP2Y1010AU0F
(GP2Y1012AU0F, GP2Y1014AU0F, GP2Y1023AU0F, GP2Y1026AU0F)



GP2Y1030AU0F

IR DETECTING UNIT FOR REMOTE CONTROL LINEUP (CLASSIFIED BY FORM)

RoHS

■IR Detecting Unit for Remote Control Lineup (Classified by Form)

Type	Package		Features	Operating voltage	Model No.	
	Form	Detection position*1 (from PCB)				
IR detecting unit for remote control	Lead L bend with shield case (holder)	16.0 mm*2	Compact size	3 to 5 V	GP1UE28XK0VF series▲	
				5 V	GP1UM28XK0VF series	
			Compact size, Strengthened resistance to electromagnetic induction noise (Mesh type)	3 to 5 V	GP1UE28RK0VF series▲	
				5 V	GP1UM28RK0VF series	
		12.0 mm*3	Compact size	3 to 5 V	GP1UE27XK0VF series▲	
				5 V	GP1UM27XK0VF series	
			Compact size, Strengthened resistance to electromagnetic induction noise (Mesh type)	3 to 5 V	GP1UE27RK0VF series▲	
				5 V	GP1UM27RK0VF series	
		6.8 mm*4	Compact size	3 to 5 V	GP1UE26XK0VF series▲	
				5 V	GP1UM26XK0VF series	
			Compact size, Strengthened resistance to electromagnetic induction noise (Mesh type)	3 to 5 V	GP1UE26RK0VF series▲	
				5 V	GP1UM26RK0VF series	
	Lead straight with shield case (holder)	19.0 mm	Compact size, Strengthened resistance to electromagnetic induction noise (Mesh type)	3 to 5 V	GP1UE29QK0VF series▲	
				5 V	GP1UM29QK0VF series	
		9.6 mm	Compact size	3 to 5 V	GP1UE28YK0VF series▲	
				5 V	GP1UM28YK0VF series	
			Compact size, Strengthened resistance to electromagnetic induction noise (Mesh type)	3 to 5 V	GP1UE28QK0VF series▲	
				5 V	GP1UM28QK0VF series	
	Holderless	Lead straight 6.0 mm		3 to 5 V	GP1UX31QS series▲	
				5 V	GP1UX51QS series	
		Lead L bend*5 5.3 mm		3 to 5 V	GP1UX31RK series▲	
				5 V	GP1UX51RK series	

*1 Lead straight: Distance from lens center to mounting board upper surface
No mesh lead L bend: Distance from tip of lens to mounting board upper surface
Mesh-type lead L bend: Distance from tip of mesh to mounting board upper surface
*2 Mesh type (strengthened resistance to electromagnetic induction noise): 16.4 mm
*3 Mesh type: 12.4 mm
*4 Mesh type: 7.2 mm
*5 Mesh type: 5.3 mm
The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

RoHS

■IR Detecting Units for Remote Control

(Ta = 25°C)

Type	Series No.	Absolute maximum ratings		Operating voltage (V)	Electrical characteristics				Size (mm)	Terminal layout
		Vcc (V)	Topr (°C)		Icc (mA)*1 MAX.	VOH (V) MIN.	VOL (V) MAX.	fo (kHz) TYP.		
With shield case (holder), 5 V drive	GP1UM26XK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 6.8	Center Vcc
	GP1UM27XK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 12.0	
	GP1UM28XK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 16.0	
	GP1UM28YK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 8.6 × 12.5(9.6)*2	
With shield case (holder), 5 V drive, Strengthened resistance to electromagnetic induction noise	GP1UM26RK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 7.2	
	GP1UM27RK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 12.4	
	GP1UM28RK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.6 × 16.4	
	GP1UM28QK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 9.0 × 12.5(9.6)*2	
	GP1UM29QK0VF	0 to 6.0	−10 to +70	4.5 to 5.5	0.6 (0.65)	Vcc−0.5	0.45	*3	5.6 × 16.2 × 21.9(19)*2	
With shield case (holder), 3 to 5 V drive	GP1UE26XK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 6.8	
	GP1UE27XK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 12.0	
	GP1UE28XK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 16.0	
	GP1UE28YK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 8.6 × 12.5(9.6)*2	
With shield case (holder), 3 to 5 V drive, Strengthened resistance to electromagnetic induction noise	GP1UE26RK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 7.2	
	GP1UE27RK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 12.4	
	GP1UE28RK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.6 × 16.4	
	GP1UE28QK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 9.0 × 12.5(9.6)*2	
	GP1UE29QK0VF▲	0 to 6.0	−10 to +70	2.7 to 5.5	0.4	Vcc−0.5	0.45	*3	5.6 × 16.2 × 21.9(19)*2	
Holderless, 5 V drive, Strengthened resistance to electromagnetic induction noise	GP1UX51QS	0 to 6.0	−10 to +70	4.5 to 5.5	0.6	Vcc−0.5	0.45	*3	5.5 × 5.3 × 7.5	Center GND
	GP1UX51RK	0 to 6.0	−10 to +70	4.5 to 5.5	0.6	Vcc−0.5	0.45	*3	5.5 × 5.3 × 7.5	
Holderless, 3 to 5 V drive, Strengthened resistance to electromagnetic induction noise	GP1UX31QS▲	0 to 6.0	−10 to +70	4.5 to 5.5	0.4	Vcc−0.5	0.45	*3	5.5 × 5.3 × 7.5	
	GP1UX31RK▲	0 to 6.0	−10 to +70	4.5 to 5.5	0.4	Vcc−0.5	0.45	*3	5.5 × 5.3 × 7.5	

Note: A voltage regulator circuit is built-in but may be affected by the usage environment. Install with an externally mounted C and R as a power supply filter.
*1 When no signal is input (during input light).
*2 Figures in parentheses indicate the distance to the light detection center.
*3 fo = 32.75/36/36.7/38/40 kHz
The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

☆New product
★Under development

■Laser Diodes

◆Main Lineup

<Visible Light Laser Diodes>

Features		Low-cost type	Compact type	Standard type	Wide operating temperature range
	Package	④ t1.8 mm Frame	② ø3.8 mm Can	① ø5.6 mm Can	
	Oscillation transverse mode	Single Mode			
	Operating temperature range (°C)	–10 to +60			–40 to +85
Wavelength	R: 638 nm	☆**GH1631AA8C** 100 mW (CW)	★**GH0631IA5G** 150 mW (CW)	**GH0631IA2GC** 180 mW (CW)	★**GH0632BA2G** 200 mW (CW)
	G: 515 nm*1	—	★**GH05130C5G** 30 mW (CW)	★**GH05130C2K** 30 mW (CW)	—*2
	B: 450 nm	—	★**GH04580A5G** 80 mW (CW)	☆**GH04580A2G** 80 mW (CW)	—*2

*1 We plan to introduce a 525 nm band green laser into our lineup.
*2 We plan to introduce a product with a wide operating temperature range.

<Infrared Laser Diodes>

Features		High beam grade	High output	Pulse 40 W class	Pulse 120 W class
	Package	① ø5.6 mm Can			
	Oscillation transverse mode	Single Mode	Multi Mode		
	Operating temperature range (°C)	–10 to +70		–40 to +105	
Wavelength	IR: 830 nm	★**GH0832GA2G** 250 mW (CW)	★**GH0832WA2G** 700 mW (CW)	–	–
	IR: 850 nm	★**GH0852GA2G** 250 mW (CW)	★**GH0852WA2G** 700 mW (CW)	–	–
	IR: 905 nm	★**GH0902GA2G** 250 mW (CW)	★**GH0902WA2G** 700 mW (CW)	★**GH09W40A2G** 33 W (Pulse)	★**GH09W1CA2G** 100 W (Pulse)
	IR: 940 nm	★**GH0942GA2G** 250 mW (CW)	★**GH0942WA2G** 500 mW (CW)	–	–

<Infrared Eye-safe Laser Diodes*3>

Features		Highly reliable and eye-safe	SMT type and eye-safe
	Package	⑥ ø5.6 mm eye-safe	⑦ SMD eye-safe
	Oscillation transverse mode	Multi Mode	
	Operating temperature range (°C)	–10 to +70	
Wavelength	IR: 850 nm	★**GH4855F3TG** 410 mW (CW)	–
	IR: 940 nm	–	★**GH4946F3AS** 530 mW (CW)

*3 Laser with improved safety for eyes.

＜notes＞

GHxxxxxxxx xx mW (CW)

Upper line: Model No.
Lower line: Light output ratings at 25℃

☆New product
★Under development

RoHS

◆Specifications

<Laser Diodes>

(Tc = 25°C)

Package	Model No.	Wavelength (band) λp (nm)	Absolute maximum ratings*1		Characteristics								Built-in monitor PD	Terminal connections	Applications
			Po (mW)	Top (°C)	Po (mW)	Ith (mA)	Iop (mA)	Vop (V)	ηd (mW/mA)	λp (nm)	θ// (°)	θ⊥ (°)			
① ø5.6 mm Can	☆GH04020D2AG	405	25	–10 to +70	20	14	21	4.8	1.3	405	9.5	20	○	1	BD player, etc
	☆GH04W10A2GC		350	0 to +50	300	140	325	4.5	1.8	406	14	41	–	8	Sensor, etc.
	☆GH04580A2G	450	85	–10 to +70	80	22	84	5.1	1.3	450	10	24	–	8	Display, etc.
	☆GH04955A2G	495	55	–10 to +60	50	30	90	6	0.85	495	8.5	23.5	–	8	Display, etc.
	☆GH05035B2K	505	35	–10 to +60	30	50	85	6	0.7	505	8	23	○	4	Display, etc.
	★GH05080A2G		85		80	55	190		0.6				–	8	
	★GH05130C2K	515	35	–10 to +60	30	50	85	6	0.7	515	8	23	○	4	Display, etc.
	☆GH06330A2G	638	30	–10 to +60	30	30	50	2.3	1.4	638	7	16	–	8	Display, etc.
	GH0631IA2GC		185	–20 to +60	180	70	215	2.55	1.15		8	13		9	
	★GH0632BA2G		210	–40 to +85	200	55	230	2.65	–			15			
	☆GH0637AA2G		700	–10 to +40	700	110	810	2.46			16	35			
	★GH0652CA2G	650	220	–40 to +90	200	55	220	2.6	–	650	8	12.5	–	9	Display, etc.
	GH06P25A1C	660	100	–10 to +70	95	40	122	2.4	1.1	661	–	–	–	3	Sensor, etc.
	GH0832BA1K	830	210	–10 to +70	200	35	215	2.1	1.1	830	9	18	○	4	Sensor, etc.
	★GH0832GA2G		260		250	45	255	2.2	1.15		8	15	–	8	
	★GH0832WA2G		700		700	275	975	1.8	1		17	45			
	★GH0852GA2G	850	260	–10 to +70	250	45	255	2.2	1.15	850	8	15	–	8	Sensor, etc.
	★GH0852WA2G		700		700	275	975	1.8	1		17	45			
	★GH0902GA2G	905	260	–10 to +70	250	30	280	2.3	1	905	9	18	–	8	Sensor, etc.
	★GH0902WA2G		700		700	(tbd)	(tbd)	(tbd)	(tbd)		(tbd)	(tbd)			
	★GH09W40A2G		Pulse 40 W	–40 to +105	Pulse 33W	700	30A	11	1.14		15	20			LiDAR, etc.
	★GH09W1CA2G		Pulse 120 W		Pulse 100W	(tbd)		(tbd)	(tbd)		(tbd)	(tbd)			
	★GH0942GA2G	940	260	–10 to +70	250	(tbd)	(tbd)	(tbd)	(tbd)	940	(tbd)	(tbd)	–	8	Sensor, etc.
	★GH0942WA2G		500		500	315	800	1.8	1		10	35			
② ø3.8 mm Can	★GH04580A5G	450	85	–10 to +70	80	22	85	5.3	1.3	450	10	24	–	8	Display, etc.
	★GH05130C5G	515	35	–10 to +60	30	50	85	6	0.7	515	8	23	–	8	Display, etc.
	☆GH0631CA5G	638	125	–10 to +60	120	70	195	2.5	–	638	9	15	–	8	Display, etc.
	★GH0631IA5G		185		150	60	190		1.15		7.5				
③ ø3.3 mm Can	GH06510F4A	650	10	–10 to +70	7	17	26	2.2	0.85	660	13	28	○	1	Sensor, etc.
	GH07P28F4C	785	150	–10 to +70	100	35	135	2.4	1	784	8	16	–	3	Sensor, etc.
④ t1.8 mm Frame	☆GH1631AA8C	638	100	–10 to +60	100	50	130	2.45	1.2	638	8	15	–	6	Display, etc.
	GH16P32C8C	660	100	–10 to +70	90	42	120	2.3	1.16	661	9.3	15	–	6	Display, etc.
⑤ t1.2 mm Frame	☆GH16320AUL	638	20	–10 to +40	20	18	50	2.5	0.6	635	8	36	–	11	Display, etc.
	★GH16312AUK		12	–10 to +50	12		38	2.4						10	

<Eye-safe Laser Diodes*2>

(Tc = 25°C)

Package	Model No.	Wavelength (band) λp (nm)	Absolute maximum ratings*1		Characteristics								Built-in monitor PD	Terminal connections	Applications
			Iop (A)	Top (°C)	Iop (mA)	Ith (mA)	øe (mW)	Vop (V)	ηd (mW/mA)	λp (nm)	θ// (°)	θ⊥ (°)			
⑥ ø5.6 mm eye-safe	★GH4855F3TG	850	1	–10 to +70	800	225	410	1.8	–	855	100	100	–	8	Sensor, etc.
⑦ SMD eye-safe	★GH4946F3AS	940	1	–10 to +70	800	140	530	1.7	–	940	90	90	–	9	Sensor, etc.

*1 The absolute maximum ratings are the limits that are not to be exceeded under any condition whatsoever, whether in testing or in actual use.
*2 Laser with improved safety for eyes.

Note: Please inquire about combinations of packages and characteristics other than the above.

RoHS

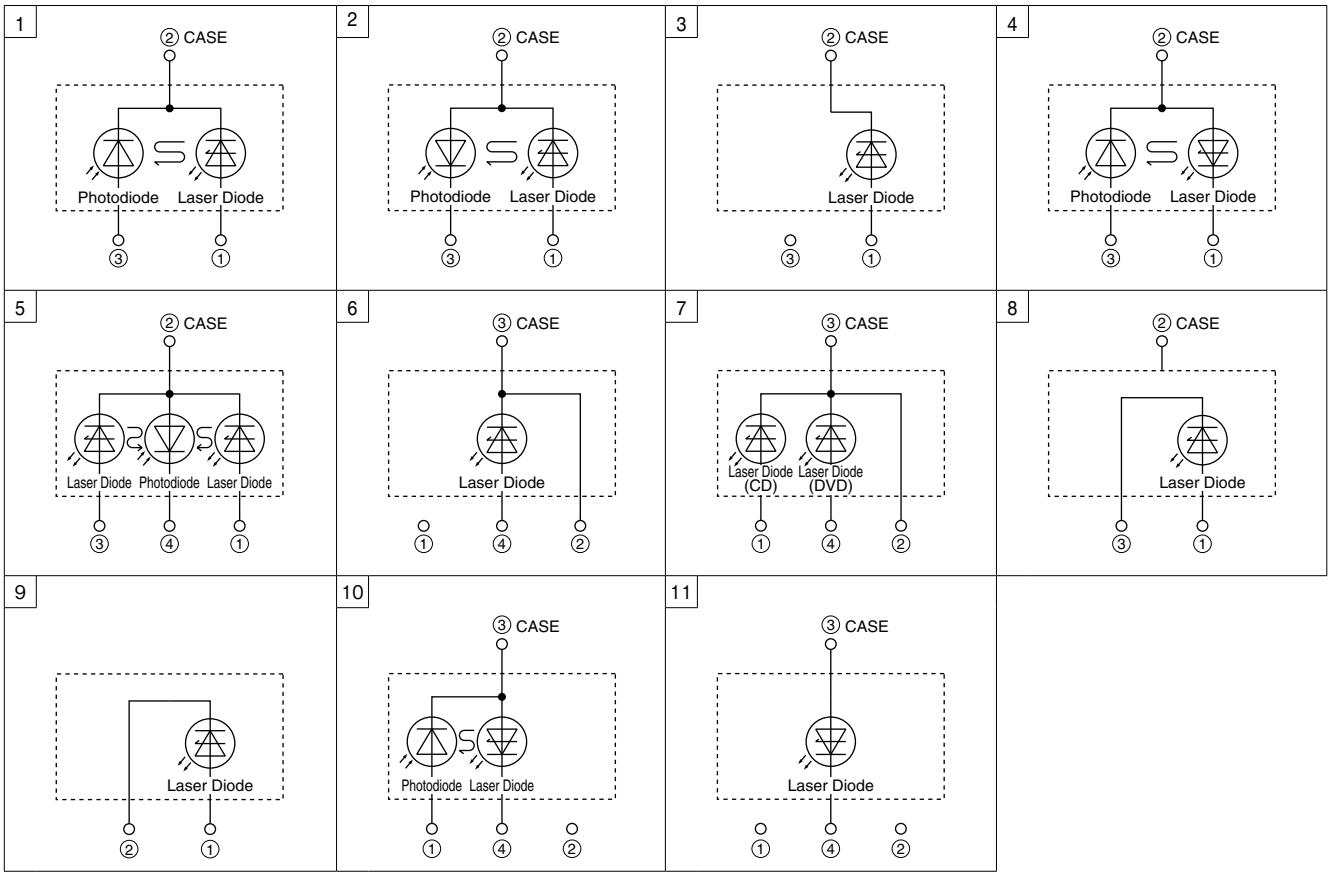
◆Package Lineup

① ø5.6 mm Can	② ø3.8 mm Can	③ ø3.3 mm Can	④ t1.8 mm Frame	⑤ t1.2 mm Frame
				

⑥ ø5.6 mm eye-safe*	⑦ SMD eye-safe*
	

* Laser with improved safety for eyes.

◆Terminal Connections



RoHS

■Digital DBS Front-end Units

◆Features

(1) Equipped with a high-performance direct conversion IC. Reliability is improved by reducing power consumption and component counts.

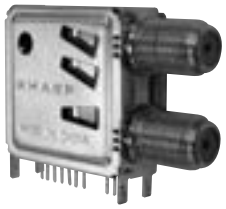
(2) Wide-band reception design also covering CS broadcast band. [Input frequency: 950 to 2 150 MHz]

(3) User support tools can be provided. [Sample/evaluation boards and software are available.]

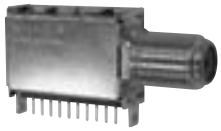
◆Standard Specifications <IQ output type>

Destination	Global (ISDB-S/DVB-S2/ABS-S)	
Input type	1-input/1-loop through output	1-input
Model No.	BS2S7VZ7D03	BS2S7VZ6D02
Input frequency (MHz)	950 to 2 150	
Input signal level (dBm)	–65 to –25	
Base band frequency bandwidth (MHz)	5 to 40, 2 MHz step (BB LPF)	
RF input local leak (dBm)	–68 and below	
Output type	I/Q	
Noise figure (dB)	6 (TYP.)	
Phase noise (dBc/Hz)	–88 (TYP.) at 10 kHz offset	
Supply voltage (V DC)	3.3	
LNB power supply	DC 25 V, 400 mA (MAX.)	
Input impedance (Ω)	75	
Outline dimensions (mm)	30.4 (W) × 29.4 (D) × 12.9 (H)	25.2 (W) × 17.4 (D) × 8.7 (H)

Note: Low-profile type is also available.



BS2S7VZ7D03



BS2S7VZ6D02

FRONT-END UNITS FOR ISDB-T/S / FRONT-END UNITS FOR DVB-T2/DTMB

RoHS

■Front-end Units for ISDB-T/S

◆Features

(1) Low phase noise characteristics, high elimination of adjacent channel interference.
(2) Compact, low power consumption.

◆Standard Specifications

Destination	Japan (ISDB-T/S)					
Model No.	VA4S5JD2358		VA4S6JD2359		VA4S7JD2371	
	Digital terrestrial	Digital satellite	Digital terrestrial	Digital satellite	Digital terrestrial	Digital satellite
Number of tuners	1	1	2	2	3	3
Input frequency (MHz)	93 to 767	950 to 2 150	93 to 767	950 to 2 150	93 to 767	950 to 2 150
Output type	DIF	I , Q	DIF	I , Q	DIF	I , Q
Noise figure (dB)	4 (TYP.)	5 (TYP.)	4 (TYP.)	5 (TYP.)	4 (TYP.)	5 (TYP.)
Phase noise (dBc/Hz)	–87 (TYP.) at 10 kHz offset	–85 (TYP.) at 10 kHz offset	–87 (TYP.) at 10 kHz offset	–85 (TYP.) at 10 kHz offset	–87 (TYP.) at 10 kHz offset	–85 (TYP.) at 10 kHz offset
Supply voltage (V DC)	1.8, 3.3, 5	3.3	1.8, 3.3, 5	3.3	1.8, 3.3, 5	3.3
Power consumption (W)	0.9	0.7	1.4	1.2	1.9	1.8
Outline dimensions (mm)	41 (W) × 34 (D) × 8.75 (H)					

VA4S7JD2371
(VA4S5JD2358, VA4S6JD2359)

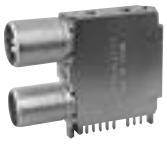
■ Front-end Units for DVB-T2/DTMB

◆Features

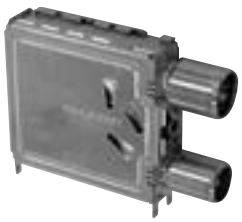
(1) Low phase noise characteristics, high elimination of adjacent channel interference.
(2) Compact, low power consumption.
(3) Other types are available with various chassis forms (vertical or horizontal type) and input connectors (F or DIN type), etc.

◆Standard Specifications

Destination	Europe/Asia (DVB-T2), China (DTMB)		
Model No.	VA4M1DX2331	VA4M1DX2323	VA4M2DX2194
Input frequency (MHz)	51 to 868		47 to 868
Output type	DIF	DIF (Off through)	DIF (Dual output)
Noise figure (dB)	5 (TYP.)		
Phase noise (dBc/Hz)	–90		
Supply voltage (V DC)	3.3, 1.8		5, 3.3, 1.8
Power consumption (W)	0.49		1.13
Outline dimensions (mm)	24.2 (W) × 25.8 (D) × 8 (H)		41.3 (W) × 37.5 (D) × 12.3 (H)



VA4M1DX2331



VA4M2DX2194

Notice
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

RoHS

■Front-end Units for Digital Terrestrial and Analog Terrestrial Broadcasting

◆Features

Contributing to the development of thinner LCD TVs and similar products by combining compatibility with digital and analog terrestrial broadcasts into a single unit.

◆Standard Specifications

Destination	Brazil	China*1
Model No.	VA4M1BC1228	VA4M1CA1309
Input frequency (MHz)	47 to 866	
Output type	IF	
Digital IF bandwidth (MHz)	6	8
Phase noise (dBc/Hz)	–90 (TYP.) at 10 kHz offset	
Supply voltage (V DC)	3.3	
Noise figure (dB)	4 (TYP.)	
Channel selection system	PLL (I^2C-bus)*2	
Outline dimensions (W) × (D) × (H) (mm)	30 × 28 × 7.5	26.2 × 20 × 10.6

*1 Built-in isolator type
*2 I^2C-bus is a trademark of Philips Corporation.

VA4M1BC1228

VA4M1CA1309

◆Features

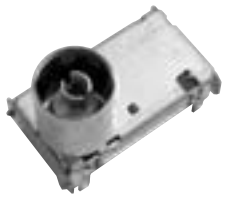
Universal specifications compatible with various broadcasting systems all over the world.

Digital: DVB-T/T2, DVB-C, ATSC, ISDB-T, DTMB

Analog: NTSC-M/N, PAL-B/G/I/DK, SECAM-L, L'

◆Standard Specifications

Destination	Global
Model No.	VA4M1DB1370
Input frequency (MHz)	47 to 868
Output type	IF
Noise figure (dB)	4 (TYP.)
Phase noise (dBc/Hz)	–90 (TYP.)
Supply voltage (V)	3.3
Outline dimensions (W) × (D) × (H) (mm)	27 × 14 × 7.5



VA4M1DB1370

Note: Contact SHARP for custom design product.
(For connector shape or facing side, analog output format, etc.)

NON-CONTACT BODY MOTION SENSOR MODULE

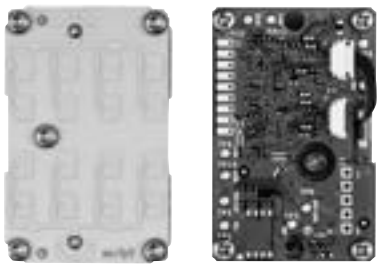
■Non-contact Body Motion Sensor Module

◆Features

(1) Measures without contact using the Doppler effect.

(2) The module can be embedded in products as sensing is possible through obstructions (except in cases where the obstructions are metal or metal plated).

(3) Enables stable measurement without being affected by factors such as temperature, direct sunlight, or reflector color.



DC6M4JN series

◆Standard Specifications

Model No.	DC6M4JN series
Output frequency (GHz)	24.05 to 24.25
Output interface	UART interface (baud rate: 115 200; data bit length: 8 bits)
Applications	Body motion
Measurable distance (m)	MAX. 10
Antenna	Planar antenna with 8 patch Tx / Rx antenna elements
Antenna pattern (deg.)	25 (azimuth), 20 (elevation)
Power supply (V)	3.3
Dissipation current (mA)	100 (including signal processing)
Outline dimensions (W)×(D)×(H) (mm)	31 × 47.5 × 21.35

PM2.5 SENSOR MODULE / TEMPERATURE AND HUMIDITY SENSOR

■PM2.5 Sensor Module

◆Features

(1) Easy assembly for use in air purifiers and other products thanks to small size of 53 × 40 × 51 mm

(2) Industry's shortest*1 detection time of 10 seconds

(3) Digital output model is also part of line-up

*1 As of May 1, 2015 (measured by Sharp)

Analog output type: DN7C3CA007
Digital output type: DN7C3CD015

◆Standard Specifications

Model No.	DN7C3CA007 [Overseas]	DN7C3CD015 [Japan / Overseas]
Measuring range (μg/m3)	25 to 500	25 to 500
Output type	Analog voltage	Digital PWM
Power supply voltage (Vcc/fan)	DC5 V / DC5 V	DC5 V / DC5 V
Power consumption (mW) (TYP.)	At sensor: 55, At fan: 450	At sensor: 75, At fan: 450
Output voltage range (V)	0 to 3.4 (MIN.)	Vhigh: Vcc-1.5 (MIN.), Vlow: 1.3 (MAX.)
Operating temperature range (°C)	–10 to +60	–10 to +60
Outline dimensions (mm)	53.0 × 40.0 × 51.0 (excluding protruding parts)	53.0 × 40.0 × 51.0 (excluding protruding parts)

■Temperature and Humidity Sensor

◆Features

(1) Package: 3.0 x 3.0 x 0.8 mm, reflowable, QFN

(2) Interface: I2C

◆Standard Specifications

Model No.	QM1H0P00xx	
Sensor	Humidity sensor	Temperature sensor
Type	Macromolecule capacity	Semiconductor
Measuring range	0 to 100% RH	–20 to +85°C
Accuracy	±2% RH (25°C)	±0.3°C
Resolution	0.1% RH	0.015°C
Interface	I2C	

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Kameyama Plant	1	EC04J0284	Development and production of LCD
FUKUYAMA	2	JQA-EM7239	Design, development and manufacture of electronic devices

JQA-QM8688
JQA-QM3776

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Certifying organization: Japan Quality Assurance Organization (JQA) [JAB certified]

Group	Certificate No.	Scope of Registered Activities
Electronic Components and Devices BU	JQA-QM8688	The Sales, design/development and manufacturing of the following products. Integrated circuits, RF devices, Opto-electronic devices, module, automotive camera, application products of camera module, LED, laser diodes, hologram laser
Display Device Company	JQA-QM3776	The design / development and manufacture of Liquid crystal display panel and module

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