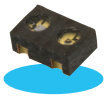
Hybrids

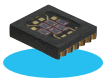
The hybrid components portfolio of TT Electronics can help to reduce costs, enhance reliability, and increase circuit performance. Our optoelectronic hybrid product designs combine opto sensors and LEDs with chip level components, to create systems that simplify motion and surface detection functions. Hybrid product technologies include visible and infrared LEDs, VCSELs, photodiode arrays, phototransistor arrays, reflective assemblies, and custom control components.

Miniature SMD Reflective Sensor



Model Number	OPR5005
Package	SMD Chip Carrier
Sensor Type	Transistor
Wavelength (nm) (Typ)	890
Reflection Distance Inch (mm)	0.05 to 0.20
$I_{C(ON)}$ (mA) Min	0.1
I_F (mA) Typ/Max	20/50
V_{CE} (V) (Max)	30
Lead Length/Spacing	SMD

Six-Element SMD Photodiode Array

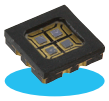


Model Number	OPR2101
Package	Surface Mount
Receiver Type	Diode Array
# of Elements	6
Responsivity (mA/mW) Min	0.45
Reverse Voltage Min	50
Active Area mm^2	0.84

Miniature Surface Mount

Model Number	OPR5200
Package	1208 Flat Lens
LED Wavelength (nm)	890
Output Power Min (mW/cm^2)	0.35
V_F (V) Max	1.8
I_F (mA) Typ/Max	20/50
Beam Angle (Degrees)	90

Surface Mount Quad Photodiode



Model Number	OPR5925
Package	Quad
Receiver Type	Photodiode Array
# of Elements	4
Responsivity (mA/mW) Min	0.45
Reverse Voltage Min	35
Active Area mm^2	0.64 X 4

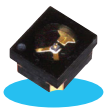
Infrared Light Emitting VCSEL

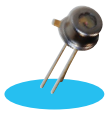
Model Number	OPR2800V
Package	Flat Lens Window
LED Wavelength (nm)	850
Output Power (mW/cm^2) Min/Max	1.5
I_F (mA) Typ/Max	7.0/12
Beam Angle (Degrees)	24
Lead Length	leadless

Surface Mount and Chip Carrier

The TT Electronics surface mount and chip carrier portfolio includes SMD emitter components, infrared LEDs, vertical cavity surface emitting diodes, photodiodes, phototransistors, optical comparators, and optoisolators.

LEDs

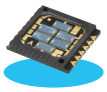
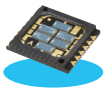
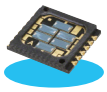
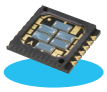





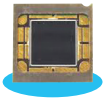
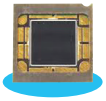
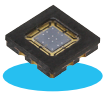
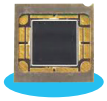
Model Number	OP181	OPR2800T	OPR5200	OPV310Y	OPV314	OPV314Y
Package	SMD	SMD	1208 Flat Lens	TO-46 Flat Window	TO-46 Bead Lens	TO-46 Bead Lens
LED Wavelength (nm)	940	880	890	850	850	850
Output Power Min (mW/cm^2)	0.26	0.2	0.35	1.5	1.4	1.4
V_F (V) Max	1.65	1.5	1.8	2.2	2.2	2.2
I_F (mA) Typ/Max	20/50	20/50	20/50	7.0/12	7.0/12	7.0/12
Beam Angle (Degrees)	10˚	100˚	90˚	24˚	-	-

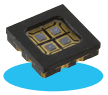
Photodiodes



Model Number	OP980	OPR2100	OPR2100HS	OPR2100HST	OPR2100T	OPR2101
Package	PLCC-2	Surface Mount	Surface Mount	Surface Mount	Surface Mount	Surface Mount
Receiver Type	Photodiode	Diode Array	Diode Array	Diode Array	Diode Array	Diode Array
# of Elements	1	6	6	6	6	6
Responsivity (mA/mW) Min	0.45	0.45	0.45	0.45	0.45	0.45
Reverse Voltage Min	60	50	50	50	50	50
Active Area mm^2	.175	3.45	3.45	3.45	3.45	0.84



Model Number	OPR5910	OPR5910T	OPR5911	OPR5913	OPR5915	OPR5925
Package	Single	Single	Quad	Single	Single	Quad
Receiver Type	Photodiode	Photodiode	Photodiode Array	Photodiode	Photodiode	Photodiode Array
# of Elements	1	1	4	1	1	4
Responsivity (mA/mW) Min	0.45	0.45	0.45	0.4	0.45	0.45
Reverse Voltage Min	35	35	14	10	35	35
Active Area mm^2	.316	.316	1.00 X 4	25	7.8	0.64 X 4

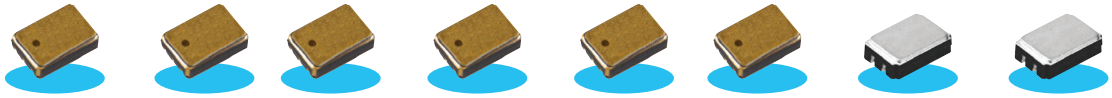
Phototransistors

Model Number	OP580DA	OPR5500
Package	PLCC-2	1208 Flat Lens
Light Current $I_{C(ON)}$ (mA) Min	10	0.036
V_{CE} (V) Max	35	30
Input Power EE (mW/cm^2)	0.15	0.15
Viewing Angle	100°	120°
Active Area mm^2	0.73	0.73

Optical Comparators

Model Number	OPR5011	OPR5011T
Package	Three Differential Comparators	Three Differential Comparators
Sensor Type	Differential Optical Comparator	Differential Optical Comparator
# of Elements	3	3
I_{CC} (mA) Typ/Max	9/20	9/20
Optical Hysteresis (%) Typ	40	40
Optical Offset (%) Min/Max	-40/+40	-40/+40

Optoisolator/Optocoupler



Model Number	4N22U 4N22UTX 4N22UTXV	4N23UTX 4N23UTXV	4N24U 4N24UTX 4N24UTXV	4N47U 4N47UTX 4N47UTXV	4N48U 4N48UTX 4N48UTXV	4N49U 4N49UTX 4N49UTXV	HCC240 HCC240TX HCC240TXV	HCC242 HCC242TX HCC242TXV
Package	6-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	4-Pin Ceramic	4-Pin Ceramic
Sensor Type	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor
Isolation Voltage (Min ,000)	1	1	1	1	1	1	1	1
CTR (Min/Max)	25/N/A	60/N/A	100/500	50/NA	100/500	200/1,000	25/60	100/150
I_F (mA) Typ/Max	1/40	1/40	1/40	1/40	1/40	1/40	10/40	10/40
V_{CE} (V) Max	40	40	40	40	40	40	30	30
Rise/Fall Times (Max. µs)	15/15	15/15	20/20	20/20	20/20	20/20	15/15	20/20