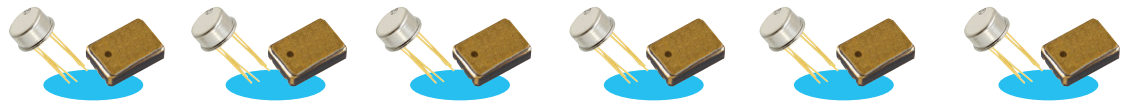


High-Reliability JAN Isolators

High-reliability JAN isolators from TT Electronics feature a choice of either hermetically sealed TO-78 package or surface mountable SM/LCC package. Each isolator in this series consists of an infrared emitting diode and a NPN silicon phototransistor, which are mounted in a hermetically sealed TO-78/SMD package. Devices are designed for military and/or harsh environments. They feature a high current transfer ratio and 1 kV electrical isolation as standard.

High-Reliability JAN Isolators



Model Number*	4N22(A)(U)	4N23(A)(U)	4N24(A)(U)	4N47(A)(U)	4N48(A)(U)	4N49(A)(U)
Package	TO-78/SMD	TO-78/SMD	TO-78/SMD	TO-78/SMD	TO-78/SMD	TO-78/SMD
CTR (Min/Max)	40/N/A	60/N/A	100/N/A	50/N/A	100/500	200/1000
Isolation Voltage (Min. kV)	1	1	1	1	1	1
I_f (mA) Max	40	40	40	40	40	40
V_{CE} (V) (Max)	35	35	35	40	40	40
Rise/Fall Times (Max. μ s)	15	15	20	20	20	25
Slash Sheet (MIL-PRF-19500)	486	486	486	548	548	548
RoHS	No	No	No	No	No	No

* Available in JAN, JANTX, JANTXV and non-JAN COTS versions.

"A" suffix denotes collector electrically isolated from case.

"U" suffix denotes SMD/LCC 6 6-pin version.

High-Reliability COTS Optoelectronics

The TT Electronics components family consists of GaAIAs/GaAs LEDs, photodarlington, photodiodes, Photologic® detectors (integrated detector), phototransistors and VCSELs. Components are available in both metal packages (Pill, TO-5, TO-18, TO-46) and plastic packages (T-1, T-1 3/4, endlooker, sidelooker). In addition to these standard offerings, TT Electronics can provide custom designs at OEM volumes in shorter lead times than can often be found among other industry off-the-shelf-solutions.

High-Reliability Hallogic Hall-Effect Sensors



Model Number	OMH3040B	OMH3075B	OMH3075S
Package	Side Sensing Ceramic	Side Sensing Ceramic	Side Sensing Ceramic
Output Type	Uni-Polar Non-Latching	Bi-Polar Latching	Bi-Polar Latching
Operating Point Gauss (Min/Typ/Max)	70/150/200	50/150/250	50/150/250
Release Point Gauss (Min/Typ/Max)	50/115/180	-250/-150/-50	-250/-150/-50
Hysteresis Gauss (Min/Typ/Max)	110/35/60	100/300/500	100/300/500
V _{CC} (Volts) Min/Max	4.5/24.0	4.5/24.0	4.5/24.0
RoHS	No	No	No

Photologic® Slotted Optical Switches



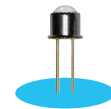
Model Number	OPB930W51Z	OPB973N51
Package	Slotted T	Slotted N
Sensor Type	Totem-Pole	Inv-Open-Collector
Gap Width/Depth	0.125"/0.315"	0.125"/0.345"
Aperture Emitter/Sensor	0.05"/0.01"	0.05"/0.01"
Wavelength (nm) (Typ)	880	890
I _F (mA) Typ/Max	20/50	20/50
I _{CCL} /I _{CCH} (mA) Max	15/15	15/15
V _{CC} (Volts) Min/Max	4.75/5.25	4.5/16.0
Lead Length/Spacing	24"/26 AWG Wire	0.425"/0.320"

High-Reliability GaAIAs Infrared Emitting Diode



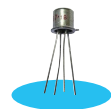
Model Number	OP224S
Package	Pill Dome Lens
LED Wavelength (nm) (Typ)	890
Output Power (μW) Min	1.5
I _F (mA) Typ/Max	50/100
Beam Angle (Degrees)	24
Lead Length	N/A

High-Reliability Hermetic Infrared Emitting Diode



Model Number	OP236TX
Package	TO-46 Dome Lens
LED Wavelength (nm) (Typ)	890
Output Power (μW) Min	3.5
I _F (mA) Typ/Max	50/100
Beam Angle (Degrees)	18
Lead Length	0.50"

High-Reliability Optically Coupled Isolator



Model Number	3C92CTX
Package	TO-72
LED Wavelength (nm) (Typ)	935
Sensor Type	Transistor
CTR (Min/Max)	0.3/2.0
Isolation Voltage (Min, 000)	1
I _F (mA) Typ/Max	10/50
V _{CE} (V) Typ/Max	10/50
Rise/Fall Times (Max, μs)	N/A

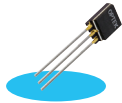
High-Reliability COTS Hall Effect

High-reliability COTS sensors from TT Electronics offer reliable performance, low form factor, and extended service life across a variety of applications. These standard offerings are available with short lead times, as well as in assorted styles and types.

Hallogic Hall Effect Sensors Hall Ceramic



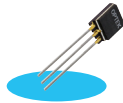
OMH090
OMH090B
OMH090S



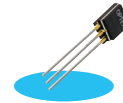
OMH3019
OMH3019B
OMH3019S



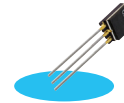
OMH3020
OMH3020B
OMH3020S



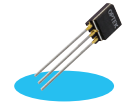
OMH3040
OMH3040B
OMH3040S



OMH3075
OMH3075B
OMH3075S



OMH3131
OMH3131B
OMH3131S



OMH3150
OMH3150B
OMH3150S

Model Number	OMH090 OMH090B OMH090S	OMH3019 OMH3019B OMH3019S	OMH3020 OMH3020B OMH3020S	OMH3040 OMH3040B OMH3040S	OMH3075 OMH3075B OMH3075S	OMH3131 OMH3131B OMH3131S	OMH3150 OMH3150B OMH3150S
Package	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic	Side Sensing 3-Leaded Ceramic
Output Type	Uni-Polar Non-Latching	Uni-Polar Non-Latching	Uni-Polar Non-Latching	Uni-Polar Non-Latching	Bi-Polar Latching	Uni-Polar Non-Latching	Ratiometric
Operating Point Gauss (Min /Typ/Max)	70/90/220	175/300/500	70/220/350	70/150/200	50/150/250	20/60/95	2.5 mV/G
Release Point Gauss (Min /Typ/Max)	30/65/180	125/235/420	50/180/330	50/115/180	-250/-150/-50	10/45/85	N/A
Hysteresis Gauss (Min /Typ/Max)	10/30/60	30/100/155	15/55/200	10/35/60	100/250/500	5/15/40	2.5 mV/G
V _{CC} (Volts) (Min/Max)	4.5/24.0	4.5/24.0	4.5/24.0	4.5/24.0	4.5/24.0	4.5/24.0	4.5V/6.0V

Hallogic Hall Effect Sensor Assemblies



OHB3040



OHB3040B



OHB3040S

Model Number	OHB3040	OHB3040B	OHB3040S
Package	Slotted Switch	Slotted Switch	Slotted Switch
Output Type	Logic	Logic	Logic
Right Operate Point (Min)*	0.073" [1.85 mm]	0.073" [1.85 mm]	0.073" [1.85 mm]
Right Operate Point (Max)*	0.003" [0.08 mm]	0.003" [0.08 mm]	0.003" [0.08 mm]
Right Release Point (Min)*	0.045" [1.14 mm]	0.045" [1.14 mm]	0.045" [1.14 mm]
Right Release Point (Max)*	-0.005" [-0.127 mm]	-0.005" [-0.127 mm]	-0.005" [-0.127 mm]
Left Release Point (Min)*	-0.045" [-1.14 mm]	-0.045" [-1.14 mm]	-0.045" [-1.14 mm]
Left Release Point (Max)*	0.005" [0.127 mm]	0.005" [0.127 mm]	0.005" [0.127 mm]
Left Operate Point (Min)*	-0.073" [-1.85 mm]	-0.073" [-1.85 mm]	-0.073" [-1.85 mm]
Left Operate Point (Max)*	-0.003" [-0.08 mm]	-0.003" [-0.08 mm]	-0.003" [-0.08 mm]
V _{CC} (Volts) (Min/Max)	4.5/25	4.5/25	4.5/25

	Right Operate Point	Right Release Point	Left Release Point	Left Operate Point
Minimum	0.073" [1,85mm]	0.045" [1,14mm]	-0.045" [-1,14mm]	-0.073" [-1,85mm]
Maximum	0.003" [0,08mm]	-0.005" [-0.127mm]	0.005" [0.127mm]	-0.003" [-0,08mm]

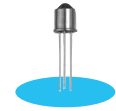
Measurements are referenced to Center Line.

LEDs

High-Reliability Photologic® Hermetic Sensors



Model Number	OP223TX OP223TXV	OP224ESA-B1, -B2 and -B3; -C1, -C2 and -C3	OP224S OP224TX OP225TXV	OP235TX OP235TXV	OP236TX OP236TXV
Package	Pill Dome Lens	Pill Dome Lens	Pill Dome Lens	TO-46 Dome Lens	TO-46 Dome Lens
LED Wavelength (nm)	890	890	890	890	890
Output Power (mW) Min	1	1.5	1.5	1.5	3.5
I _F (mA) Typ/Max	50/100	50/100	50/100	50/100	50/100
Beam Angle (Degrees)	24	24	24	18	18
Lead Length	N/A	N/A	N/A	0.50"	0.50"



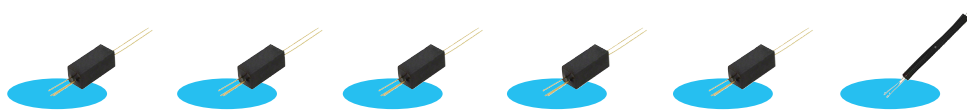
Model Number	OPL800TX OPL800TXV
Package	Hermetic, Lensed TO-18
Photologic	Totem-Pole
Irradiance (mW/cm ²)	3
V _{CC} (V) Typ/Max	4.5 - 10.0
Lead Length	0.50"

Optically Coupled Isolators



Model Number	3C91CTX 3C91CTXV	3C92CTX 3C92CTXV	3N243TX	3N244TX	3N245TX	3N261TX	3N262TX	3N263TX
Package	TO-72	TO-72	TO-72	TO-72	TO-72	TO-72	TO-72	TO-72
LED Wavelength (nm)	935	935	880	880	880	880	880	880
Sensor Type	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor
CTR (Min/Max)	0.3/1.90	0.3/2.0	0.15/N/A	0.3/N/A	0.6/N/A	0.5/N/A	1/5	2/10
Isolation Voltage (Min ,000)	1	1	1	1	1	1	1	1
I _F (mA) Typ/Max	10/50	10/50	3/40	3/40	3/40	1/40	1/40	1/40
V _{CE} (V) Typ/Max	10/50	10/50	10/30	10/30	10/30	5/30	5/30	5/30
Rise/Fall Times (Max. μs)	N/A	N/A	10	10	10	20	20	25

High-Reliability Optically Coupled Isolators



Model Number	OPI120 OPI120TX OPI120TXV	OPI123	OPI125 OPI125TX OPI125TXV	OPI126	OPI127	OPI150 OPI150TX OPI150TXV
Package	Axial Channel	Axial Channel	Axial Channel	Axial Channel	Axial Channel	Axial-Cylindrical
LED Wavelength (Nm)	890	890 or 935	890 or 935	935	890	890
Sensor Type	Transistor	Darlington	Totem Pole	Open Collector	Inv-Totem Pole	Transistor
CTR (Min/Max)	20	50	Logic 15 mA	Logic 15 mA	Logic 15 mA	10
t _{PLH} /t _{PHL} Typ (ns)	N/A	N/A	N/A	N/A	5/5	N/A
Isolation Voltage (Min ,000)	15	15	15	15	15	50
I _F (mA) Typ/Max	10/50	10/50	7.5/25	7.5/25	7.5/25	16/100
V _{CE} (V) Typ/Max	5/25	20	35	35	35	5/30
Lead Length/Spacing	0.44"/0.90"	0.40"/0.75"	0.44"/0.90"	0.40"/0.75"	0.40"/0.75"	0.40"/3.16"

High-Reliability NPN Silicon Phototransistors

Sensor Type: Transistor (ALL)



Model Number	OP602TX OP602TXV	OP603TX OP603TXV	OP604ESA-B1, -B2, -B3; -C2, -C2, -C3	OP604S OP604TX OP604TXV	OP803TX OP803TXV	OP804TX OP804TXV	OP805TX OP805TXV
Package	Low Lens	Low Lens	Low Lens	Low Lens	TO-18/46 Dome Lens	TO-18/46 Dome Lens	TO-18/46 Dome Lens
Light Current $I_{C(ON)}$ (μ A) Min/Max	2/5	4/8	7/N/A	7/N/A	4/8	7/22	15/N/A
V_{CE} (V) Typ/Max	5/50	5/50	5/50	5/50	5	5	5
Input Radiance EE (mW/cm ²)	20	20	20	20	5	5	5
Viewing Angle (Degrees)	35	35	35	35	25	25	25
Lead Length	N/A	N/A	N/A	N/A	0.5"	0.5"	0.5"

Slotted Switches - Transistor Type Sensor (ALL)



Model Numbers	OPB821TX OPB821TXV	OPB847TX OPB847TXV	OPB848TX OPB848TXV
Package Type	Slotted Wires	Slotted N	Slotted N
LED Wavelength (nm)	880	890	890
Slot Width/Depth	0.080"/0.255"	0.100"/0.250"	0.100"/0.250"
Light Current $I_{C(ON)}$ (mA) Min	0.8	4	1
I_f (mA) Typ/Max	20/50	20/30	20/30
V_{CE} (V) Typ/Max	30	30	30
Aperture Emitter/Sensor	0.04"/0.04"	0.025"/0.025"	0.06"/0.06"
Lead Length/Spacing	24"/26 AWG Wire	0.425"/0.300"	0.425"/0.300"

Slotted Switches - Transistor Type Sensor (ALL)

Package Type: Slotted L



Model Numbers	OPB870L11TX OPB870L11TXV	OPB870L51TX OPB870L51TXV	OPB870L55TX OPB870L55TXV	OPB871L51TX OPB871L51TXV	OPB871L55TX OPB871L55TXV	OPB872L51TX OPB872L51TXV	OPB872L55TX OPB872L55TXV
LED Wavelength (nm)	890	890	890	890	890	890	890
Slot Width/Depth	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"
Light Current $I_{C(ON)}$ (mA) Min	0.5	0.5	0.5	1.0	1.0	1.8	1.8
I_f (mA) Typ/Max	20/50	20/50	20/50	20/50	20/50	20/50	20/50
V_{CE} (V) Typ/Max	50	50	50	50	5/50	50	50
Aperture Emitter/Sensor	0.01"/0.01"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"
Lead Length/Spacing	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"

Slotted Switches - Transistor Type Sensor (Continued)

Package Type: Slotted N



Model Numbers	OPB870N11TX OPB870N11TXV	OPB870N51TX OPB870N51TXV	OPB870N55TX OPB870N55TXV	OPB871N51TX OPB871N51TXV	OPB871N55TX OPB871N55TXV	OPB872N51TX OPB872N51TXV	OPB872N55TX OPB872N55TXV
LED Wavelength (nm)	890	890	890	890	890	890	890
Slot Width/Depth	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"
Light Current IC(ON) (mA) Min	0.5	0.5	0.5	1.0	1.0	1.8	1.8
I _F (mA) Typ/Max	20/50	20/50	20/50	20/50	20/50	20/50	20/50
V _{CE} (V) Typ/Max	50	50	50	5/50	5/50	50	50
Aperture Emitter/Sensor	0.01"/0.01"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"
Lead Length/Spacing	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"

Slotted Switches - Transistor Type Sensor (Continued)

Package Type: Slotted P



Model Numbers	OPB870P11TX OPB870P11TXV	OPB870P51TX OPB870P51TXV	OPB870P55TX OPB870P55TXV	OPB871P51TX OPB871P51TXV	OPB871P55TX OPB871P55TXV	OPB872P51TX OPB872P51TXV	OPB872P55TX OPB872P55TXV
LED Wavelength (nm)	890	890	890	890	890	890	890
Slot Width/Depth	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"
Light Current IC(ON) (mA) Min	0.5	0.5	0.5	1.0	1.0	1.8	1.8
I _F (mA) Typ/Max	20/50	20/50	20/50	20/50	20/50	20/50	20/50
V _{CE} (V) Typ/Max	50	50	50	50	50	50	50
Aperture Emitter/Sensor	0.01"/0.01"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"
Lead Length/Spacing	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"

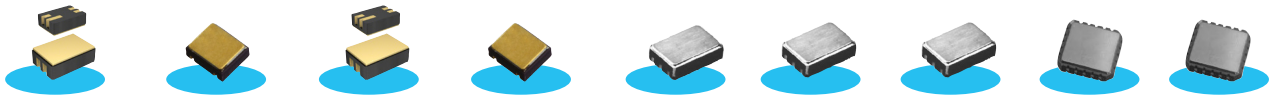
Slotted Switches - Transistor Type Sensor (Continued)

Package Type: Slotted T



Model Numbers	OPB870T11TX OPB870T11TXV	OPB870T51TX OPB870T51TXV	OPB870T55TX OPB870T55TXV	OPB871T51TX OPB871T51TXV	OPB871T55TX OPB871T55TXV	OPB872T11TX OPB872T11TXV	OPB872T51TX OPB872T51TXV	OPB872T55TX OPB872T55TXV
LED Wavelength (nm)	890	890	890	890	890	890	890	890
Slot Width/Depth	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"	0.125"/0.345"
Light Current IC(ON) (mA) Min	0.5	0.5	0.5	1.0	1.0	1.8	1.8	1.8
I _F (mA) Typ/Max	20/50	20/50	20/50	20/50	20/50	20/50	20/50	20/50
V _{CE} (V) Typ/Max	30	30	50	5/50	5/50	50	50	50
Aperture Emitter/Sensor	0.01"/0.01"	0.05"/0.01"	0.05"/0.05"	0.05"/0.01"	0.05"/0.05"	0.01" / 0.01"	0.05"/0.01"	0.05"/0.05"
Lead Length/Spacing	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"	0.425"/0.320"

Transistors



Model Number	2N2222AUA 2N2222AUATX 2N2222AUATXV	2N2222AUB 2N2222AUBTX 2N2222AUBTXV	2N2907AUA 2N2907AUATX 2N2907AUATXV	2N2907AUB 2N2907AUBTX 2N2907AUBTXV	2N4854U 2N4854UTX 2N4854UTXV	2N5794U 2N5794UTX 2N5794UTXV	2N5796U 2N5796UTX 2N5796UTXV	2N6987U 2N6987UTX 2N6987URXV	2N6989U 2N6989UTX 2N6989UTXV
Package	4-Pin Ceramic	3-Pin Ceramic	4-Pin Ceramic	3-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	6-Pin Ceramic	20-Pin Ceramic	20-Pin Ceramic
Sensor Type	NPN Transistor	NPN Transistor	PNP Transistor	PNP Transistor	NPN & PNP Transistor	Dual-NPN Transistor	Dual-PNP Transistor	Quad-PNP Transistor	Quad-NPN Transistor
H_{FE} Min/Max	50/325	50/325	75/450	75/450	50/300	35/300	75/300	75/450	50/325
V_{CE0} (Volts) Max	50	50	60	60	40	40	60	60	50
Rise/Fall Times Max (ns)	35/300	35/300	45/300	45/300	45/300	45/310	50/140	45/300	35/300

Reflective Switches Sensor Type: Transistor



Model Number	OPB700TX OPB700TXV
Package	Reflective Switch
LED Wavelength (nm)	890
Reflection Distance in (mm)	0.200 (5.08)
$I_{C(ON)}$ (μ A) Min	0.05
I_f (mA) Typ/Max	40/50
V_{CE} (V) Typ/Max	5/50
Wire Length	24"/26 AWG Wire

Surface Mount Optically Coupled Isolators



Model Number	HCC240TX HCC240TXV	HCC242TX HCC242TXV	HCC240TX HCC240TXV	HCC242TX HCC242TXV
Package	4-Pin Ceramic	4-Pin Ceramic	4-Pin Ceramic	4-Pin Ceramic
Sensor Type	Transistor	Transistor	1	1
CTR (Min/Max)	25/60	100/150	10/40	10/40
Isolation Voltage (Min, 000)	1	1	5.0/30	5.0/30
I_f (mA) Typ/Max	5.0/30	5.0/30	15/15	20/20
V_{CE} (V) Typ/Max	10/15	10/20	15/20	15/20
Rise/Fall Times Max (μ s)	15/20	15/20		

Surface Mount MOS and MOFSET Transistors



Model Number	HCT7000MTX HCT7000MTXV	HCT802TX HCT802TXV
Package	3-Pin Ceramic	6-Pin Ceramic
Sensor Type	N-Channel Enhanced MOSFET	N&P-Channel Enhanced MOSFET
V_{DSS} (Volts) Min	60	90
$V_{GS(TH)}$ (Volts) Min/Max	0.8/3.0	0.5/2.5 & -2.0/-4.5
$I_D(ON)$ (mA) Min	75	1.5 & -1.1
G_{fs} (ms) Min	100	170 & 200
t(ON)/t(OFF) (ns) Max	10/10	15/17 & 50/50