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OPTOCOUPLERS + SOLID STATE RELAYS | 2011

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Optocouplers

Solid State Relays - SSRs

Renesas Optocoupler Families Overview, Package Styles and Part Numbering System

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PS25XX Series	*Transistor Output*	*4 and 16 pin DIP and DIP SMT*	**23-25**
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PS95XX Series	*High Speed Digital*	*8 pin DIP and SMT DIP*	**24**
PS98XX Series	*High Speed Digital*	*SO8*	**26**

Channels

1 *One Channel*
2 *Two Channel*
4 *Four Channel*

Configuration Indentifier

CTR Rank

* **PSXX XX [ ] [ ] - X - XX - X - A**

* This is intended to explain existing part numbers and is not to be used to create part numbers since all combinations are not available.

Blank *Standard Part*

A or C *Alternate Die Version*
B or D *High Temerature Version*

Pb-Free

A *SnBi Plating*
AX *NiPdAu Plating*

Package Style

Blank *Thru-Hole DIP, SOP, SSOP or Renesas Mini Flat*
L *SMT DIP*
L1 *Thru-Hole DIP, Gull Wing**
L2,L3,L4 *SMT DIP Gull Wing** *(see package drawings)*
**8mm Creepage versions available for selected parts.*

Tape & Reel Options

E3 *Small Reel*
F3 *Large Reel*

For details, download:
http://www.cel.com/pdf/misc/tape_reel.pdf

Transistor Output Series

Function		4-pin DIP, 5KV iso	SOP, 3.75KV iso	Small SOP, 2.5KV iso	4-pin flat lead, 2.5KV iso
Standard	*Single*	*PS2501*	*PS2381 (Long Creepage), 5KV iso*	*PS2801C*	*PS2911*
Standard	*Single*	*PS2501A*	*PS2701A*	*PS2811*	*PS2913*
Standard	*Single*	*PS2513*	*PS2703*	*PS2841*	
Standard	*Single*	*PS2514*	*PS2711*	*PS2861B, 3.75KV iso*	
Standard	*Single*	*PS2561*	*PS2761B*		
Standard	*Single*	*PS2561D*			
Standard	*Darlington*	*PS25x2*	*PS2702*	*PS2802*	-
AC Input	*Single*	*PS25x5*	*PS27x5*	*PS28x5*	*PS2915*
AC Input	*Single*		*PS2705A*	*PS2805C*	
AC Input	*Darlington*	*PS2506*	-	-	-
Low Input Current		*PS2503*	*PS271x*	*PS281x*	*PS291x*
High Collector to Emitter Voltage		*PS253x*	*PS2733*	*PS2833*	*PS2933*

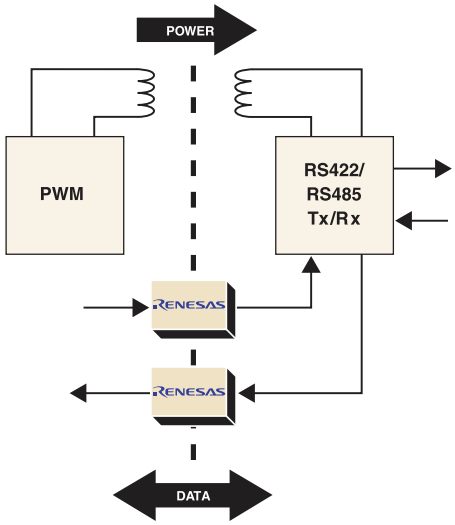
IC Output

Function			8-pin DIP Creepage 8mm, 5KV iso	5-pin SOP (SO-5), 3.75 KV iso	6-pin SDIP Creepage 8mm, 5KV iso	8-pin Small SOP (SO-8), 2.5KV iso
High-Speed	*1Mbps*	*Analog Output*	*PS8501*	*PS8101*	*PS8302 (TA=110°C)*	*PS8802-1/-2*
High-Speed	*1Mbps*	*Analog Output*	*PS8502*			*PS8821-1/-2*
High-Speed	*1Mbps*	*Digital Output*	*PS9513*	*PS9113*	*PS9303 (Active high)*	*PS9822-1/-2*
High-Speed	*1Mbps*	*Digital Output*		*PS9213 (Creepage 5.5mm)*	*PS9313 (TA=110°C)*	
High-Speed	*1Mbps*	*Digital Output*		*PS9122*		
High-Speed	*10Mbps*	*Digital Output*	*PS9587*	*PS9117A*	*PS9317*	*PS9817A-1/-2*
High-Speed	*15Mbps*	*Digital Output*	-	*PS9121*	-	*PS9821-1/-2*
High-Speed	*15Mbps*	*CMOS Output*	-	*PS9151*	-	*PS9851-1/-2*
Isolation Amplifier		*Analog Output*	*PS8551*	-	-	-
		Digital Output	*PS9551*	-	-	-

Motor Drive

Function		8-pin DIP Creepage 8mm	5-pin SOP (SO-5)	6-pin SDIP Creepage 8mm	8-pin SDIP Creepage 8mm
Motor Drive (Inverter)		*PS9513*	*PS9113*	*PS9303 (Active high)*	-
			PS9213 (Creepage 5.5mm)	*PS9313 (TA=110°C)*	
IGBT Drive	*0.6A*	*PS9506*	-	*PS9306L*	-
	2.5A	*PS9505*	-	-	*PS9305L*

Recommended Optocouplers by Application



RS422/485 Interface Isolation

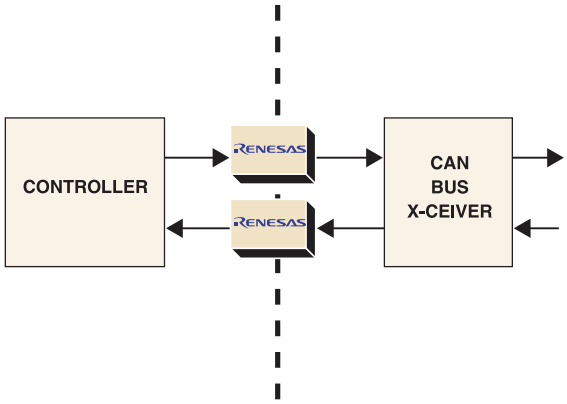
The RS485 serial communications standard is commonly used in data acquisition applications. The standard supports 32 drivers and receivers in a 2- or 4-wire differential configuration with cable lengths up to 4000 feet. Galvanic isolation becomes critical in the prevention of ground loops, electrical noise, and power spikes in widely distributed systems.

Application Requirements

- Wide range of data transfer rates: 1 Mbps to 15 Mbps
- High Common Mode Rejection Ratio (CMRR)
- Compact size
- Repeatability
- Reliability

Recommended Renesas Optocouplers

Tx/Rx Input: **PS8802-1, 2, PS8821-1, 2** *(1 Mbps)*
PS9117A, PS9817A-1/2 *(10 Mbps)*
PS9121, PS9821-1, 2 *(15 Mbps)*
Tx/Rx Output: **PS2711** *(Transistor Optocoupler)*



CAN Interface Isolation

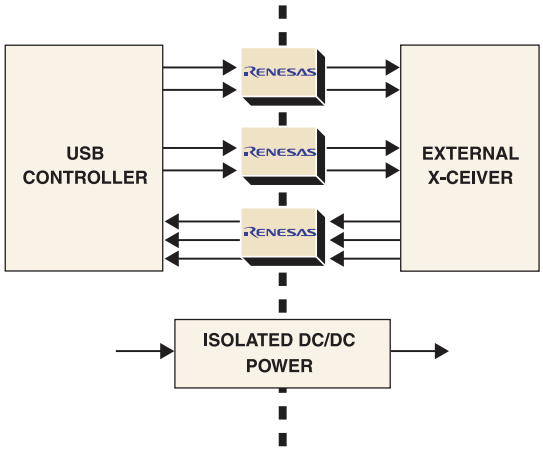
Controller Area Network (CAN) is a serial communications bus popular in industrial applications. Point-to-point and multi-point systems use it to coordinate and synchronize events. Isolation is required in these distributed systems to protect against over-voltage transients, prevent ground loops, and reduce signal distortion.

Application Requirements

- Accurate signal timing
- High Common Mode Rejection Ratio (CMRR)
- Compact size
- Repeatability
- Reliability

Recommended Renesas Optocouplers

PS9151, PS9851-1, 2



USB 2.0 Interface Isolation

USB is an inexpensive, high speed bus-integration interface used in computer-based systems. While the USB standard does not mandate isolation, designers recognize its importance in critical systems. Isolation protects USB interfaces from electrostatic discharge (ESD), ground loops, common mode noise, and EMI interference.

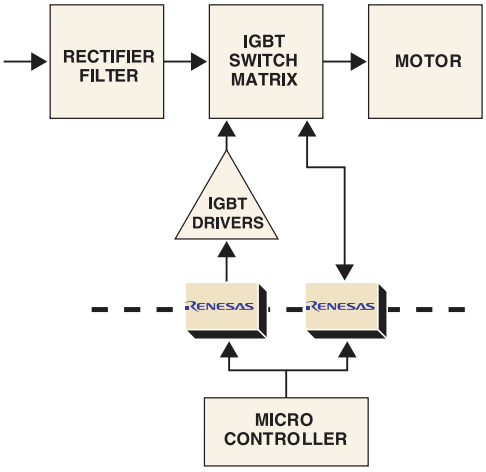
Application Requirements

- High CMRR
- Compact Size
- Low power consumption
- Data Transfer Rates: up to 15 Mbps
- Reliability

Recommended Renesas Optocouplers

PS9121, PS9151, PS9821-1, 2, PS9851-1, 2

Recommended Optocouplers by Application



Motor Drive Control Isolation

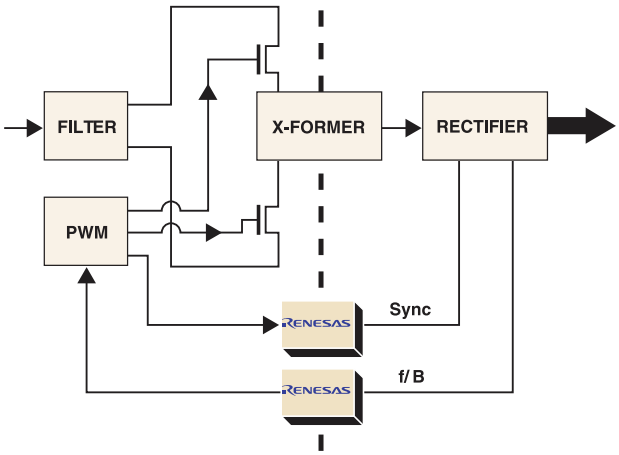
Motor controllers combine low level logic with high voltage, high power electronics like Intelligent Power Modules (IPM). Isolation enables communication between the controllers and the drivers at both the high and low side power modules. Faults and other events are typically transferred across this isolation barrier as well.

Application Requirements

- Fast response time: <0.8µs
- High Common Mode Rejection Ratio (CMRR): >10kV/µs
- Isolation: typically 2500V AC
- Long creepage: up to 8mm

Recommended Renesas Optocouplers

PS9113, PS9213, PS9301, PS9513, PS9305L, PS9505, PS9506, PS8551, PS9551



Power Supply Isolation

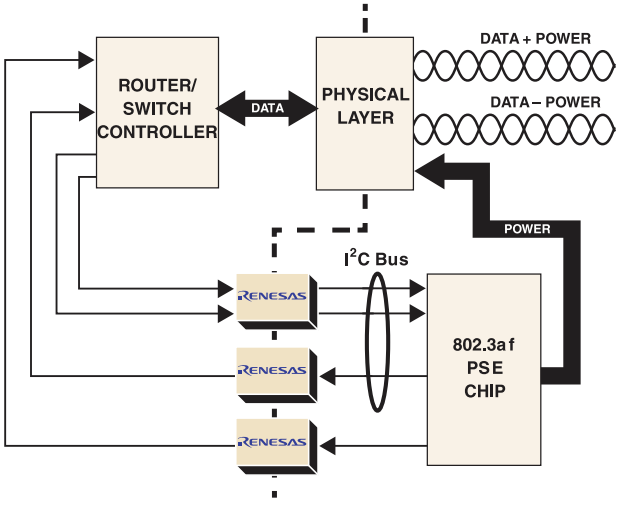
Power supplies are used in a wide variety of applications. Galvanic isolation is required for safety and to allow independent secondary side isolation. High speed optocouplers are used to transfer gate drive and synchronous rectification signals from the controller to the switching elements.

Application Requirements

- High temperature: up to 100°C
- Fast response time
- Low power consumption
- Compact size
- Repeatability

Recommended Renesas Optocouplers

Sync: **PS8501, PS9817A-1, -2**
Feedback: **PS2381, PS2561D, PS2911, PS2761B** *(Transistor Optocouplers)*



802.3af Power over Ethernet (PoE)

PoE offers a simple, reliable, cost effective solution for power transmission. It can deliver 13W of power over existing Ethernet cabling in applications ranging from industrial IT to home office networks. To ensure safety, the 802.3af standard requires 1500V AC of galvanic isolation between the main switch circuitry and the Media Dependent Interface (RJ-45 terminal). The communication from the switch to the PSE chip occurs over an isolated I^2C bus.

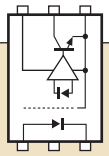
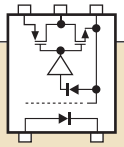
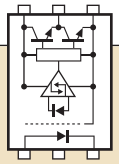
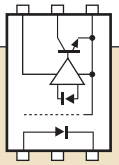
Application Requirements

- 3.3V and 5V operation
- 1500VAC minimum isolation
- Small size
- Standard Mode (100 Kbps data rate)
- Fast Mode (400 Kbps data rate)
- Fast Mode + (1Mbps)
- High Speed (3.4 Mbps)

Recommended Renesas Optocouplers

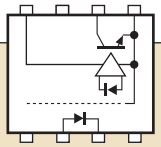
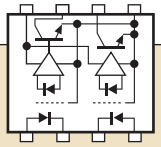
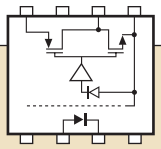
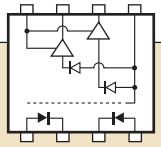
PS8821-1, 2, PS9122 *(Standard Mode)*
PS9121, PS9122 *(Fast Mode)*
PS9117A, PS9121, PS9821-1/2, PS9817A *(High Speed)*
PS9122, PS9822 *(Fast Mode +)*
PS2841-4, PS2911 *(Transistor Optocouplers)*

High Speed Digital Optocouplers

Package	Part Number	Speed (Mpbs)	Vcc Range (V) *Recommended*	Absolute Max Rating			Typ		Safety Certification[1]
				BV (Vr.m.s.)	I_O (mA)	I_F (mA)	t_{PHL} (ns)	t_{PLH} (ns)	
 ***Single channel, open collector output***									*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SOP5	**PS9117A**	10	4.5 to 5.5	3750	25	30	40	45	UL, VDE
SOP5	**PS9121**	15	2.7 to 3.6	3750	25	30	40	45	UL, VDE
SOP5[2]	**PS9122**	1	N = 2.7 to 3.6 L = 4.5 to 5.5	3750	10	25	500 max	700 max	UL, VDE
SOP5 5.5mm Creepage[2]	**PS9213**	1	4.5 to 30	2500	15	25	250	520	UL, VDE
 ***Single channel, CMOS output, –40 to 100°C operation***									*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SOP5	**PS9151**	15	4.5 to 5.5	3750	2	20	35	35	UL, VDE
 ***Single channel, totem pole output, –40 to 100°C operation***									*Isolation for IPM Drivers, Inverters*
SDIP6 Gull Wing SDIP6 8mm Creepage	**PS9303L** **PS9303L2**	1	4.5 to 20	5000	25	20	250	250	UL, VDE, CSA
 ***Single channel, open collector output***									*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SDIP6 Gull Wing SDIP6 8mm Creepage	**PS9317L** **PS9317L2**	10	4.5 to 5.5	5000	25	20	40	35	UL, VDE, CSA

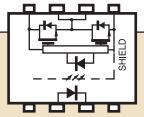
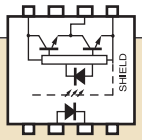
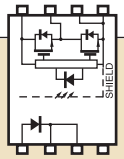
NOTES: 1. Other safety certifications available, see data sheet. 2. –40 to 100°C operation

High Speed Digital Optocouplers *Continued...*

Package	Part Number	Speed (Mpbs)	Vcc Range (V) *Recommended*	Absolute Max Rating			Typ		Safety Certification[1]
				BV (Vr.m.s.)	I_O (mA)	I_F (mA)	t_{PHL} (ns)	t_{PLH} (ns)	
	***Single channel, open collector output***								*Isolation for measurement equipment, plasma display panels and factory automation equipment*
DIP8 Thru-Hole	**PS9587**	10	4.5 to 5.5	5000	25	30	35	45	UL, VDE
DIP8 Thru-Hole 8mm Creepage	**PS9587L1**								
SMT DIP8 8mm Creepage	**PS9587L2**								
SMT DIP8 Gull Wing	**PS9587L3**								
SO8	**PS9817A-1**	10	4.5 to 5.5	2500	25	20	40	45	UL, VDE
SO8	**PS9821-1**	15	2.7 to 3.6	2500	25	20	45	50	UL, VDE
SO8	**PS9822-1**	1	N = 2.7 to 3.3 L = 4.5 to 5.5	2500	25	20	500 max	700 max	UL, VDE
	***Two channel, open collector output***								*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SO8	**PS9817A-2**	10	4.5 to 5.5	2500	25	15	40	45	UL, VDE
SO8	**PS9821-2**	15	2.7 to 3.6	2500	25	15	45	50	UL, VDE
SO8	**PS9822-2**	1	N = 2.7 to 3.3 L = 4.5 to 5.5	2500	25	15	500 max	700 max	UL, VDE
	***Single channel, CMOS output***								*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SO8	**PS9851-1**	15	4.5 to 5.5	2500	2	20	34	37	UL, VDE
	***Two channel, CMOS output***								*Isolation for measurement equipment, plasma display panels and factory automation equipment*
SO8	**PS9851-2**	15	4.5 to 5.5	2500	2	20	34	37	UL, VDE

NOTES: 1. Other safety certifications available, see data sheet.

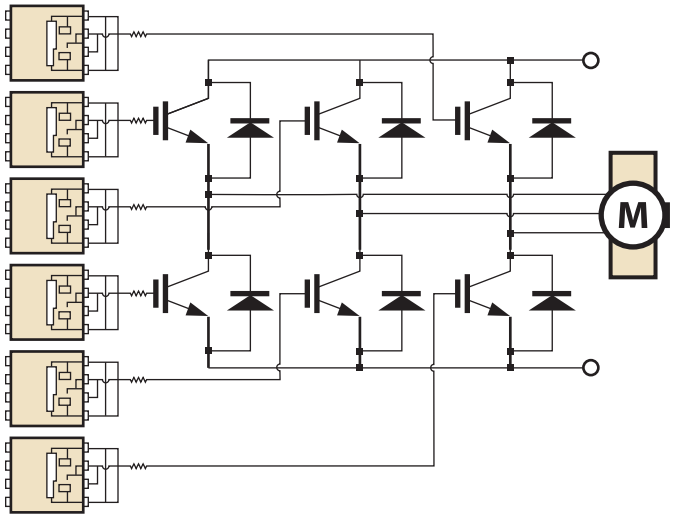
Digital Optocouplers for MOSFET and IGBT Driver Isolation

Package	Part Number	Vcc Range (V)	t_{PHL} - t_{PLH} (ns) max	Typ t_{PHL} (ns)	Typ t_{PLH} (ns)	BV (Vr.m.s.)	Safety Certification
	***Single channel for MOSFET, IGBT driver isolation*** *Features - 2.5A Output Current, High CMR(25kV/us), UVLO (Under Voltage Lock Out) protection with hysteresis*						
DIP8 Thru-Hole	**PS9505L**	15 to 30	100	180	180	5000	UL, VDE, CSA
DIP8 Thru-Hole 8mm Creepage	**PS9505L1**						
SMT DIP8 Gull Wing 8mm Creepage	**PS9505L2**						
SMT DIP8 Gull Wing	**PS9505L3**						
	***Single channel for MOSFET, IGBT driver isolation*** *Features - 0.6A Output Current, High CMR(25kV/us)*						
DIP8 Thru-Hole	**PS9506**	10 to 30	150	180	180	5000	UL, VDE, CSA
DIP8 Thru-Hole 8mm Creepage	**PS9506L1**						
SMT DIP8 Gull Wing 8mm Creepage	**PS9506L2**						
SMT DIP8 Gull Wing	**PS9506L3**						
	***Single channel for MOSFET, IGBT driver isolation, Industrial inverter, induction heating*** *Features - 2.5A Output Current, High CMR (25kV/us), UVLO (Under Voltage Lock Out) protection with hysteresis*						
8 pin SDIP Gull Wing	**PS9305L**	15 to 30	100	180	180	5000	UL, VDE, CSA

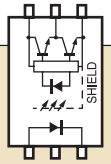
Continued next page

Motor Drive Isolation

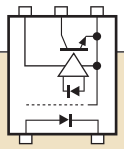
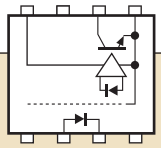
Motor drive applications demand more voltage and current than most ICs and microcontrollers can provide. A variety of devices have been developed to address the problem such as IGBTs, MOSFETs and Intelligent Power Modules (IPMs). These high power drivers use optocouplers to isolate other ICs and components from the power spikes and electrical noise that their motors generate.



Digital Optocouplers for MOSFET and IGBT Driver Isolation *Continued...*

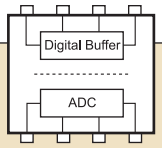
Package	Part Number	Vcc Range (V)	t_{PHL}- t_{PLH} (ns) max	Typ		BV (Vr.m.s.)	Safety Certification
				t_{PHL} (ns)	t_{PLH} (ns)		
	***Single channel for MOSFET, IGBT driver isolation*** *Features - 0.6A Output Current, High CMR (25kV/us)*						
6 pin SDIP Gull Wing 6 pin SDIP Gull Wing 8 mm Creepage	**PS9306L** **PS9306L2**	10 to 30	150	180	180	5000	UL, VDE, CSA

Digital High Functionality Optocouplers for Motor Drive Applications

Package	Part Number	Vcc Range (V) *Recommended*	Absolute Max Rating			Typ		Safety Certification [1]
			BV (Vr.m.s.)	I_O (mA)	I_F (mA)	t_{PHL} (ns)	t_{PLH} (ns)	
	***Single channel, open collector output, high temp operation***					*Isolation for intelligent power module drivers, inverters*		
SOP5 [2]	**PS9113**	4.5 to 35	3750	15	25	250	520	UL, VDE
SDIP6 Gull Wing [3] SDIP6 Gull Wing 8mm Creepage [3]	**PS9313L** **PS9313L2**	-0.5 to 35	5000	15	25	240	460	UL, VDE, CSA
	***Single channel, open collector output, –40 to 100°C operation***					*Isolation for intelligent power module drivers, inverters*		
DIP8 Thru-Hole DIP8 Thru-Hole 8mm Creepage SMT DIP8 Gull Wing 8mm Creepage SMT DIP8 Gull Wing	**PS9513** **PS9513L1** **PS9513L2** **PS9513L3**	4.5 to 35	5000	15	25	250	520	UL, VDE, CSA, BSI

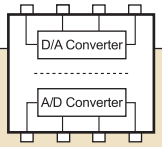
NOTES: 1. Other safety certifications available, see data sheet. 2. –40 to 100°C operation. 3. –40 to 110°C operation.

Isolation Amplifier – Digital

Package	Part Number	Vcc Range (V) *Recommended*	Input Supply Current I_{DD1} (mA max)	Output Supply Current I_{DD2} (mA max)	Resolution (bits min)	Output Clock Frequency (MHz typ)	BV (Vr.m.s.)	Safety Certification[1]
	***Digital isolation amplifier for motor drive applications***							
SMT DIP8 Gull Wing 8mm Creepage	**PS9551L4**	4.5 to 5.5	14	10	15	10	5000	UL, CSA, BSI

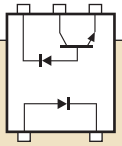
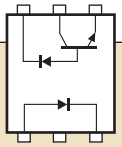
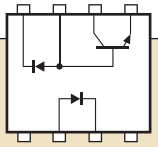
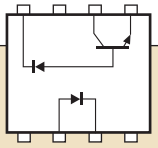
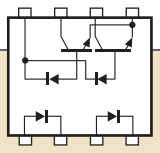
NOTES: 1. Other safety certifications available, see data sheet.

Isolation Amplifier – Analog

Package	Part Number	Absolute Max Rating		Input Supply Current I_{DD1} (mA max)	Output Supply Current I_{DD2} (mA max)	Output Bandwidth (kHz typ)	Gain V/V (typ)	Gain Error (%)	Safety Certification[1]
		BV (Vr.m.s.)	Vcc (V)						
	***Analog isolation amplifier for motor drive applications, –40 to 100°C operation***								
SMT DIP8 Gull Wing 8mm Creepage	**PS8551L4**	5000	5.5	18	16	100	8	±3%	UL, CSA, BSI

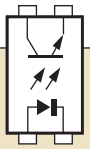
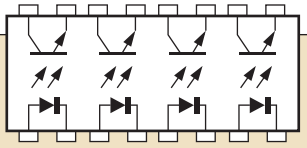
NOTES: 1. Other safety certifications available, see data sheet.

High Speed Analog Optocouplers

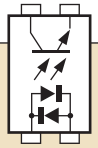
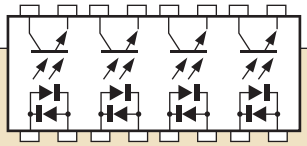
Package	Part Number	Speed (Mbps)	Absolute Max Ratings BV (Vr.m.s.)	Vcc (V)	IC (mA)	IF (mA)	Typical t_{PHL} (ns)	t_{PLH} (ns)	CTR [1] (N = Full range) Rank (%)	Safety Certification [2]
	***Single channel for power supplies, inverters, computers, peripherals, –55 to 100°C operation***									
SOP5	**PS8101**	1	3750	35	8	25	500	600	**(N = 15 to 35)** K = 20 to 35	UL, VDE
	***Single channel for power supplies, inverters, computers, peripherals, –40 to 110°C operation***									
SDIP6 SMT Gull Wing	**PS8302L**	1	5000	35	8	25	220	350	15 min	UL, VDE, CSA
SDIP6 SMT Gull Wing 8mm Creepage	**PS8302L2**									
	***Single channel for measurement and control equipment, modems, inverters, –55 to 100°C operation***									
DIP8 Thru-Hole	**PS8501**	1	5000	35	8	25	220	350	15 min	UL, CSA, BSI
DIP8 Thru-Hole 8mm Creepage	**PS8501L1**									
SMT DIP8 Gull Wing 8mm Creepage	**PS8501L2**									
SMT DIP8 Gull Wing	**PS8501L3**									
	***Single channel for measurement and control equipment, modems, inverters, –55 to 100°C operation***									
DIP8 Thru-Hole	**PS8502**	1	5000	35	8	25	220	350	15 min	UL, CSA, BSI
DIP8 Thru-Hole 8mm Creepage	**PS8502L1**									
SMT DIP8 Gull Wing 8mm Creepage	**PS8502L2**									
SMT DIP8 Gull Wing	**PS8502L3**									
SO8	**PS8802-1**	1	2500	35	8	25	300	600	**(N = 15 to 35)**	UL, VDE
SO8	**PS8821-1**	1	2500	7	8	25	300	500	**(N = 20 to...)** [3]	UL, VDE
	***Two channel for measurement and control equipment, modems, inverters, –55 to 100°C operation***									
SO8	**PS8802-1**	1	2500	35	8	25	300	600	**(N = 15 to 35)**	UL, VDE
SO8	**PS8821-1**	1	2500	7	8	25	300	500	**(N = 20 to...)** [3]	UL, VDE

NOTES: 1. CTR measured at VCC = 4.5V, IF = 16 mA. 2. Other safety certifications available, see data sheet. 3. CTR measured at VCC = 3.3V, IF = 16 mA.

Single Transistor, General Purpose DC Optocouplers

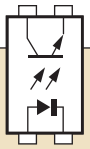
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC device for low-speed logic applications***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP4 Thru-Hole SMT DIP4	**PS2501** **PS2501L**	5000	80	80	50	**N = 80 to 600** K = 300 to 600 L = 200 to 400 M = 80 to 240 D = 100 to 300 H = 80 to 160 W = 130 to 260 Q = 100 to 200	UL
DIP4 Thru-Hole SMT DIP4 *For high temp applications see **PS2561D**, page 18*	**PS2501A** **PS2501AL**	5000	70	30	30	**N = 50 to 400** H = 80 to 160 W = 130 to 260 Q = 100 to 200 L = 200 to 400 K = 300 to 600	UL
SOP4 *For high temp applications see **PS2761B**, page 18*	**PS2701A**	3750	70	30	30	**N = 50 to 300** P = 150 to 300 L = 100 to 300 M = 50 to 150	UL, VDE, CSA
SSOP4 *For high temp applications see **PS2861B**, page 18*	**PS2801C**	2500	80	30	30	**N = 50 to 400** L = 100 to 300 M = 100 to 400 P = 150 to 300	UL, VDE, CSA
 ***Four channel DC device for low-speed logic applications***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP16 Thru-Hole SMT DIP4	**PS2501-4** **PS2501L-4**	5000	80	80	50	**N = 80 to 600**	UL
SSOP16	**PS2801C-4**	2500	80	30	30	**N = 50 to 400** M = 100 to 400	UL, CSA

Single Transistor, General Purpose AC Optocouplers

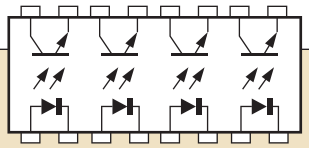
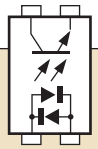
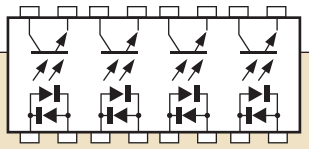
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel AC devices with high isolation voltage***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP4 Thru-Hole SMT DIP4	**PS2505** **PS2505L**	5000	80	± 80	50	**N = 80 to 600**	UL
SOP4	**PS2705A**	3750	70	± 30	30	**N = 50 to 300** L = 100 to 300 M = 50 to 150	UL, VDE, CSA
SSOP4	**PS2805C**	2500	80	± 30	30	**N = 50 to 400** M = 100 to 400	UL, VDE, CSA
 ***Four channel AC devices with high isolation voltage***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP16 Thru-Hole SMT DIP16	**PS2505-4** **PS2505L-4**	5000	80	± 80	50	**N = 80 to 600**	UL
SSOP16	**PS2805C-4**	2500	80	± 30	30	**N = 50 to 400** M = 100 to 400	UL, VDE, CSA

NOTE: Other safety certifications available, see data sheet.

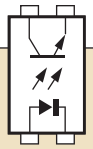
Single Transistor DC & AC Optocouplers, Characterized for low input current (1 mA)

Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 *Single channel DC device optimized for power supply applications*						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP4 Thru-Hole SMT DIP4	**PS2503** **PS2503L**	5000	40	80	30	**N = 100 to 400** K = 200 to 400 L = 150 to 300 M = 100 to 200	UL, CSA
DIP4 Thru-Hole SMT DIP4	**PS2513** **PS2513L**	5000	120	60	30	**N = 25 to 100**	UL, VDE
SOP4	**PS2711**	3750	40	50	40	**N = 100 to 400** K = 200 to 400 L = 150 to 300 M = 100 to 200	UL, VDE
SSOP4	**PS2811**	2500	40	50	40	**N = 100 to 400** K = 200 to 400 L = 150 to 300 M = 100 to 200	UL, VDE
4 Pin Mini Flat	**PS2911**	2500	40	50	40	**N = 100 to 400** K = 200 to 400 L = 150 to 300 M = 100 to 200	UL, VDE, BSI
4 Pin Mini Flat	**PS2913**	2500	120	50	30	**N = 50 to 200** K = 100 to 200 L = 75 to 150 M = 50 to 100	UL, VDE, BSI

Single Transistor DC & AC Optocouplers, Characterized for low input current (1 mA) *Continued...*

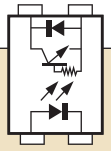
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
	***Four channel DC device optimized for power supply applications***					*CTR measured @ VCE = 5V, IF = 5mA*	
SSOP16	**PS2811-4**	2500	40	50	40	**N = 100 to 400**	UL, VDE
	***Single channel AC devices optimized for power supply applications***					*CTR measured @ VCE = 5V, IF = 5mA*	
SOP4	**PS2715**	3750	40	±50	40	**N =100 to 400**	UL, VDE, BSI
SSOP4	**PS2815**	2500	40	±50	40	**N = 100 to 400**	UL, VDE
4 Pin Mini Flat	**PS2915**	2500	40	±50	40	**N = 100 to 400**	UL, VDE, BSI
	***Four channel AC device optimized for power supply applications***					*CTR measured @ VCE = 5V, IF = 5mA*	
SSOP16	**PS2815-4**	2500	40	±50	40	**N = 100 to 400**	UL, VDE

Single Transistor DC Optocouplers, Guaranteed 0.4mm Insulation

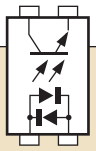
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification [1]
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC devices, high isolation voltage***						*CTR measured @ VCE = 5V, IF = 5mA*	
4 pin LSOP stretched Gull Wing 8mm Creepage ***-40°C to +115°C operation***	**PS2381**	5000	80	60	50	**N = 50 to 400** L = 100 to 300 M = 50 to 150 W = 130 to 260	UL, VDE, CSA
DIP4 Thru-Hole ***110°C operation*** SMT DIP4 ***110°C operation*** DIP4 Thru-Hole Gull Wing ***110°C operation*** SMT DIP4 Gull Wing ***110°C operation***	**PS256D1** **PS2561DL** **PS2561DL1** **PS2561DL2**	5000	80	40	50	**N = 50 to 400** H = 80 to 160 L = 200 to 400 Q = 100 to 200 W = 130 to 260	UL, VDE, BSI, CSA
SOP4 ***110°C operation***	**PS2761B**	3750	70	25	40	**N = 50 to 400** K = 200 to 400 M = 50 to 150 L = 100 to 300	UL, BSI
SSOP4 ***110°C operation***	**PS2861B**	3750	70	50	50	**N = 50 to 400**	UL, BSI, CSA, VDE

NOTES: 1. Other safety certifications available, see data sheet.

Single Transistor, with internal base-emitter resistor to increase the switching time

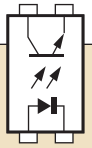
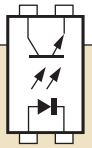
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC device with internal base-emitter resistor to increase the switching time***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP4 Thru-Hole SMT DIP4	**PS2514** **PS2514L**	5000	40	30	20	**N = 50 to 200**	UL, VDE, CSA

Single Transistor AC Optocouplers, Guaranteed 0.4mm Insulation (BSI)

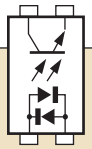
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification [1]
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel AC devices, high isolation voltage***						*CTR measured @ VCE = 5V, IF = 5mA*	
DIP4 Thru-Hole SMT DIP4 DIP4 Thru-Hole Gull Wing SMT DIP4 Gull Wing	**PS2565** **PS2565L** **PS2565L1** **PS2565L2**	5000	80	±80	50	**N = 80 to 400**	UL, VDE, BSI, CSA

NOTES: 1. Other safety certifications available, see data sheet.

Single Transistor, High Performance DC Optocouplers

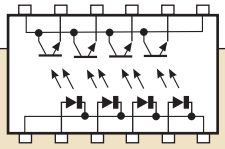
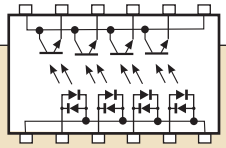
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC device, high drive current, high isolation voltage***						*CTR measured @ VCE = 3V, IF= 100mA*	
DIP4 Thru-Hole SMT DIP4	**PS2521** **PS2521L**	5000	80	150	50	**N =20 to 80**	UL, CSA
 ***Single channel DC devices, high VCE***						*CTR measured @ VCE and IF as noted*	
DIP4 Thru-Hole SMT DIP4	**PS2503** **PS2503L**	5000	40	80	30	***VCE = 5V, IF = 1mA*** **N = 100 to 400** K = 200 to 400 L = 150 to 300 M = 100 to 200	UL, CSA
DIP4 Thru-Hole SMT DIP4	**PS2513** **PS2513L**	5000	120	60	30	***VCE = 5V, IF = 5mA*** **N = 50 to 200**	UL, VDE
SOP4	**PS2703**	3750	120	50	30	***VCE = 5V, IF = 5mA*** **N = 50 to 400** K = 200 to 400 L = 100 to 300 M = 50 to 150	UL, VDE, BSI, CSA
4 Pin Mini Flat	**PS2913**	2500	120	50	30	***VCE = 5V, IF = 1mA*** **N = 50 to 200** K = 100 to 200 L = 75 to 150 M = 50 to 100	UL, VDE, BSI

Single Transistor, High Performance AC Optocouplers

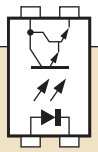
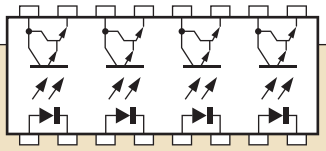
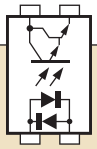
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel AC devices, high drive current, high isolation voltage***						*CTR measured @ VCE = 3V, IF = 100mA*	
DIP4 Thru-Hole SMT DIP4	**PS2525** **PS2525L**	5000	80	±150	50	**N = 20 to 80**	UL, CSA

NOTES: 1. Other safety certifications available, see data sheet.

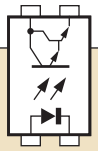
Single Transistor Optocouplers in Miniature Quad Packages

Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 *PS2841-4A* *PS2841-4B* ***Four channel, DC devices***						*CTR measured @ VCE = 5V, IF = 1mA*	
SSOP12 SSOP12	**PS2841-4A** **PS2841-4B**	1500	70	20	20	**N = 100 to 400**	UL
 ***Four channel, AC device***						*CTR measured @ VCE = 5V, IF = 1mA*	
SSOP12	**PS2845-4A**	1500	70	±20	20	**N = 100 to 400**	UL

Darlington Transistor, General Purpose Optocouplers

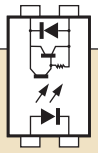
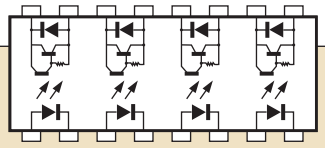
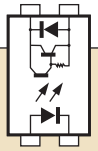
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	V_{CEO} (V)	I_F (mA)	I_C (mA)		
 ***Single channel DC devices, high isolation voltage***						*CTR measured @ V_{CE} = 2V, I_F = 1mA*	
DIP4 Thru-Hole SMT DIP4	**PS2502** **PS2502L**	5000	40	80	200	**N = 200** min K = 2000 min L = 700 to 3400 M = 200 to 1000	UL
SOP4	**PS2702**	3750	40	50	200	**N = 200** min K = 2000 min L = 700 to 3400 M = 200 to 1000	UL, VDE, BSI
SSOP4	**PS2802**	2500	40	50	90	**N = 200 min** K = 2000 min L = 700 to 3400 M = 200 to 1000	UL, VDE, BSI, CSA
 ***Four channel DC devices, high isolation voltage***						*CTR measured @ V_{CE} = 2V, I_F = 1mA*	
DIP16 Thru-Hole SMT DIP16	**PS2502-4** **PS2502L-4**	5000	40	80	160	**N = 200 min**	UL
SSOP16	**PS2802-4**	2500	40	50	100	**N = 200 min**	UL, VDE, BSI, CSA
 ***Single channel AC device, high isolation voltage***						*CTR measured @ V_{CE} = 2V, I_F = ±1mA*	
DIP4 Thru-Hole SMT DIP4	**PS2506** **PS2506L**	5000	40	±80	200	**N = 200 min**	UL

Darlington Transistor Optocouplers, Guaranteed 0.4mm insulation (BSI)

Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification [1]
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC device, high isolation voltage***						*CTR measured @ VCE = 2V, IF = 1mA*	
DIP4 Thru-Hole	**PS2562**	5000	40	80	200	**N = 200** min	UL, VDE, BSI, CSA
SMT DIP4	**PS2562L**					K = 2000 to 3400	
DIP4 Thru-Hole Gull Wing	**PS2562L1**					L = 700 to 3400	
SMT DIP4 Gull Wing	**PS2562L2**					M = 200 to 1000	

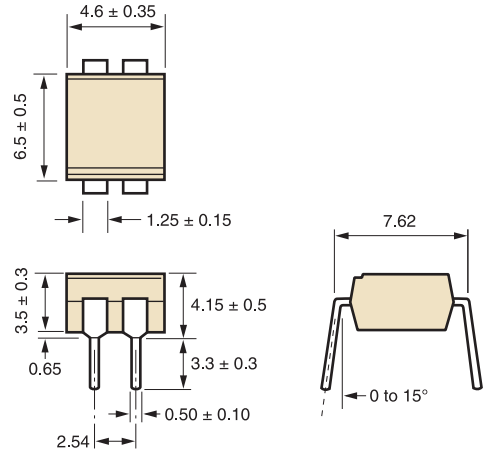
NOTES: 1. Other safety certifications available, see data sheet.

Darlington Transistor, High VCEO DC Optocouplers

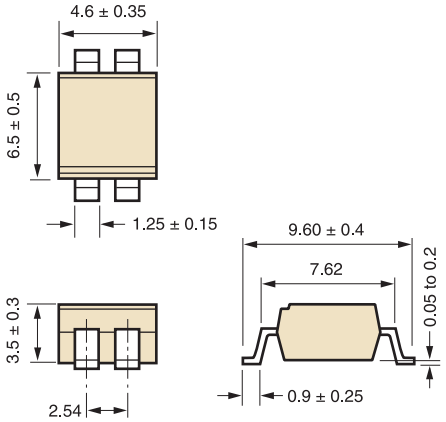
Package	Part Number	Absolute Maximum Ratings				CTR (N = Full range) Rank (%)	Safety Certification
		BV (Vr.m.s.)	VCEO (V)	IF (mA)	IC (mA)		
 ***Single channel DC devices***						*CTR measured @ VCE = 2V, IF = 1mA*	
DIP4 Thru-Hole	**PS2533**	5000	350	80	150	**N = 1500** to 6500	UL, VDE, BSI
SMT DIP4	**PS2533L**						
SOP4	PS2733	2500	350	50	150	N = 1500 min	UL, VDE, BSI
SSOP4	PS2833	2500	350	50	60	N = 400 to 4500	UL
4 Pin Mini Flat	PS2933	2500	350	50	60	N = 400 to 4500	UL, VDE, BSI
 ***Four channel DC device***						*CTR measured @ VCE = 2V, IF = 1mA*	
SSOP16	**PS2833-4**	2500	350	50	60	**N = 400 to 4500**	UL
 ***Single channel DC devices***						*CTR measured @ VCE = 2V, IF = 1mA*	
DIP4 Thru-Hole	**PS2535**	5000	350	50	120	**N = 400** to 5500	UL, VDE, BSI
SMT DIP4 Gull Wing	**PS2535L**					L = 1500 to 5500	

Renesas Packages *Dimensions in millimeters. Dimensions are nominal, please refer to data sheets*

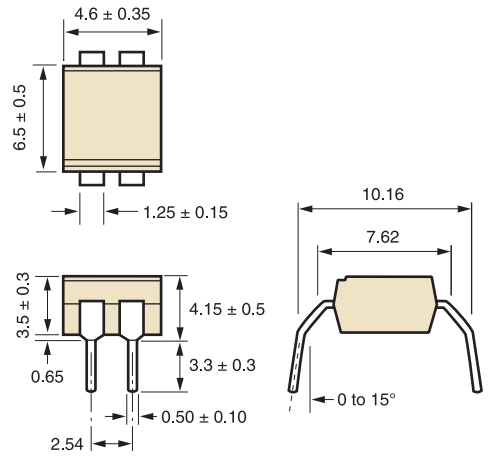
DIP4 Thru-Hole



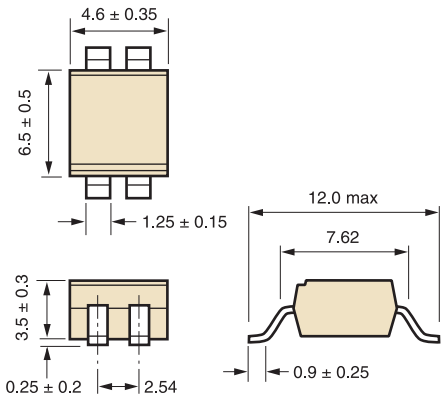
L — SMT DIP4



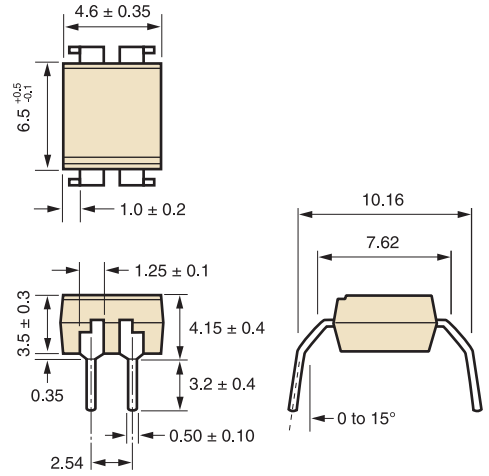
L1 — DIP4 Thru-Hole Gull Wing



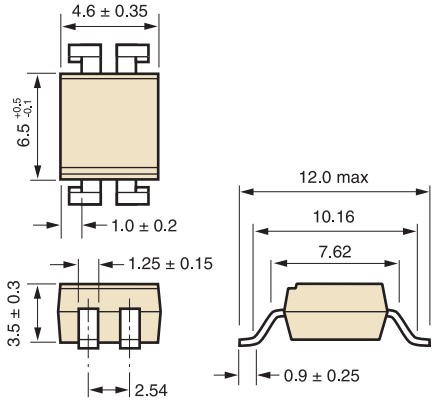
L2 — SMT DIP4 Gull Wing



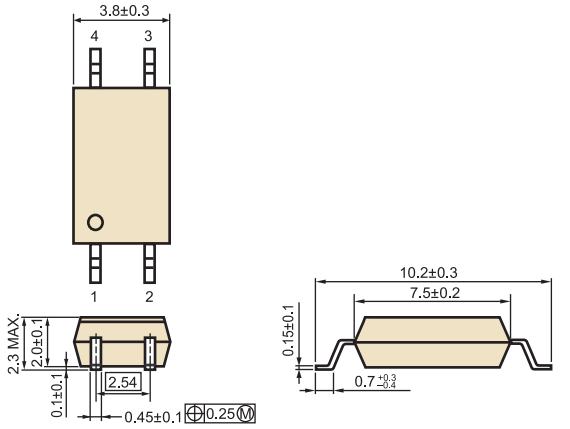
L1 — DIP4 Thru-Hole Gull Wing with 8mm Creepage



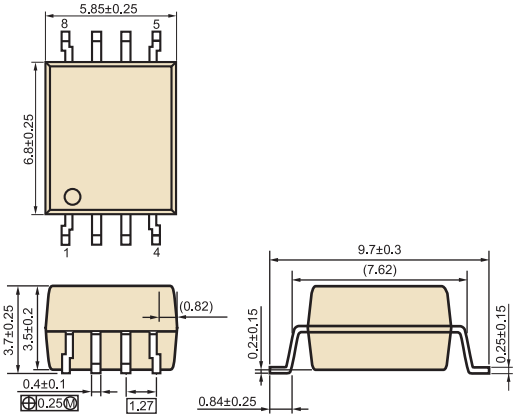
L2 — SMT DIP4 Gull Wing with 8 mm Creepage



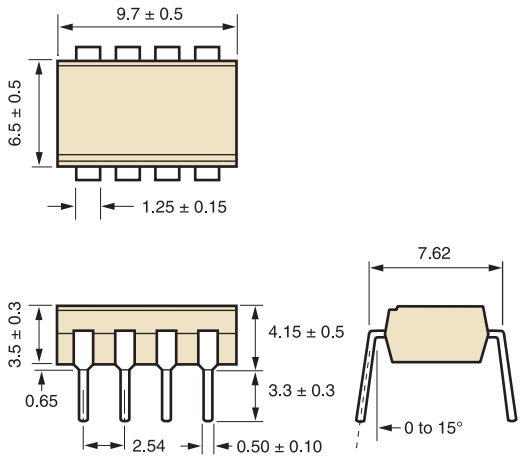
4-PIN LSOP



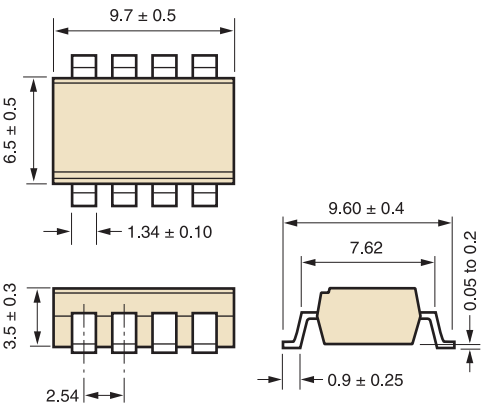
8-PIN SDIP



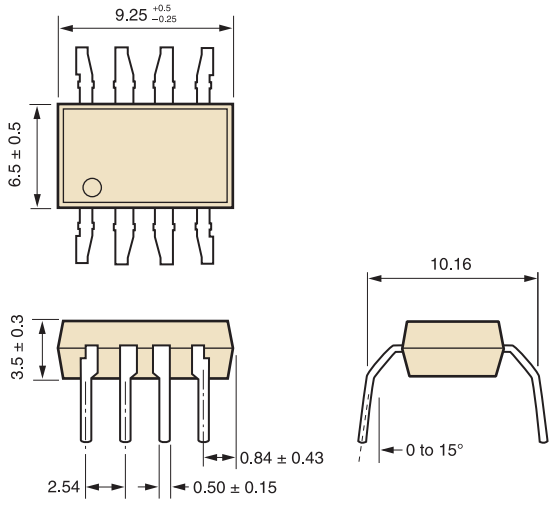
DIP8 Thru-Hole



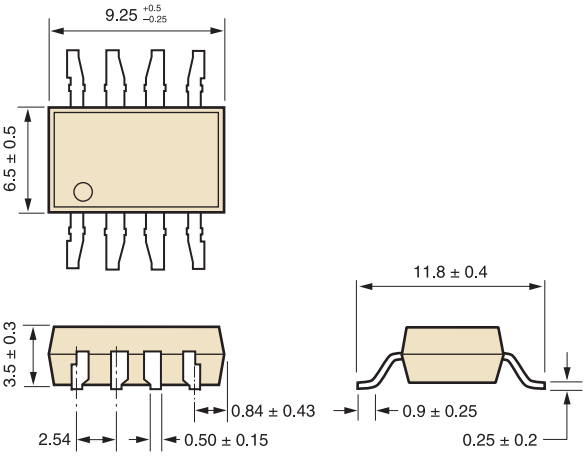
L — SMT DIP8



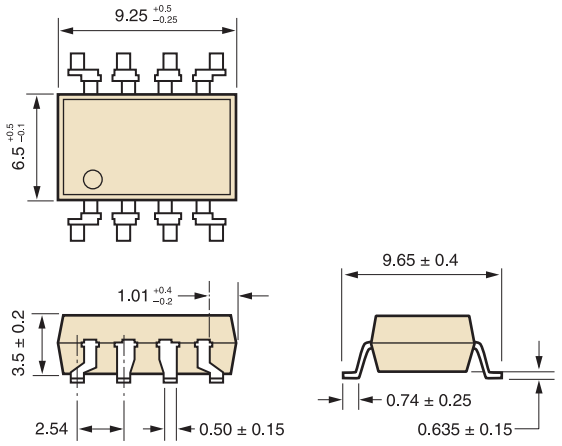
L1 — DIP8 Thru-Hole with 8mm Creepage



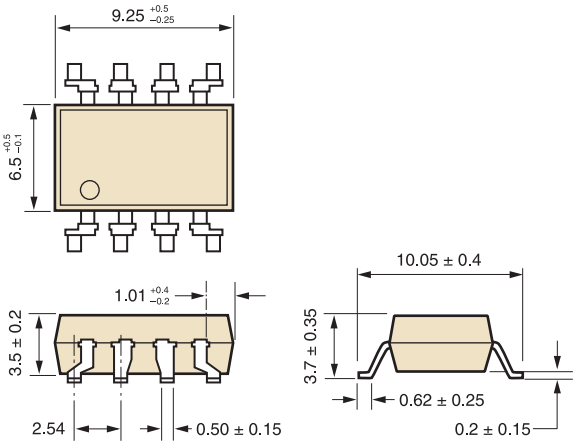
L2 — SMT DIP8 Gull Wing with 8mm Creepage



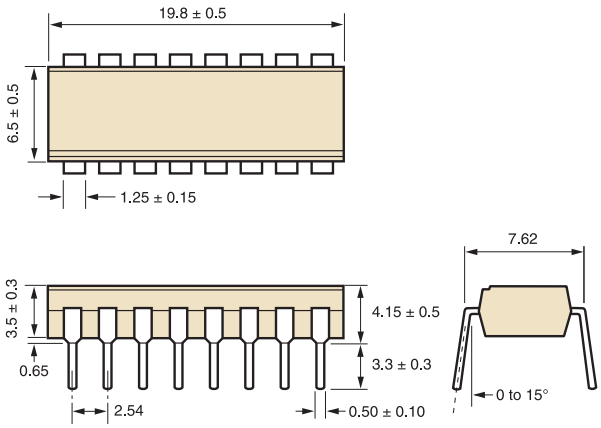
L3 — SMT DIP8 Gull Wing



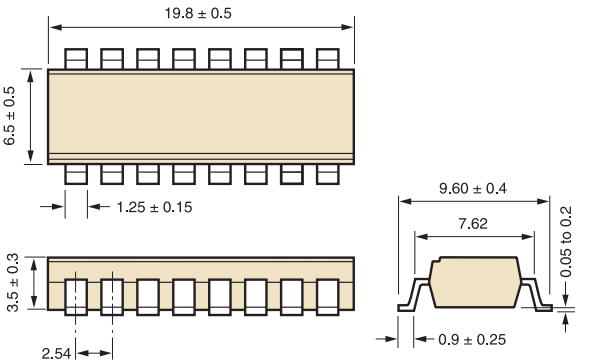
L4 — SMT DIP8 Gull Wing with 8mm Creepage



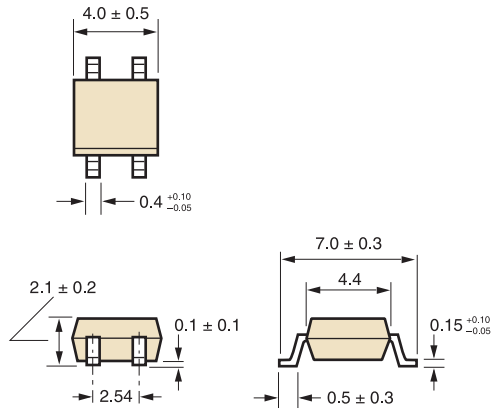
DIP16 Thru-Hole



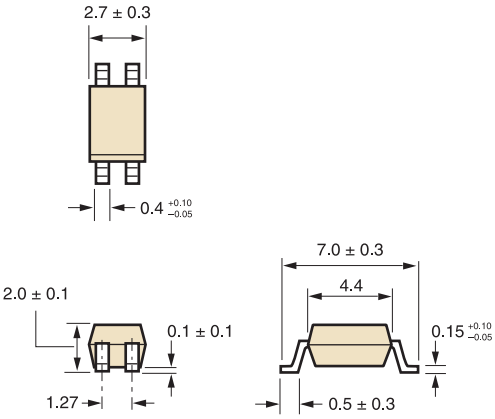
L — SMT DIP16



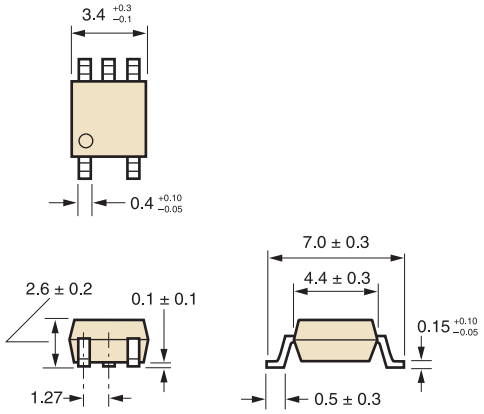
SOP4 2.54mm pin pitch



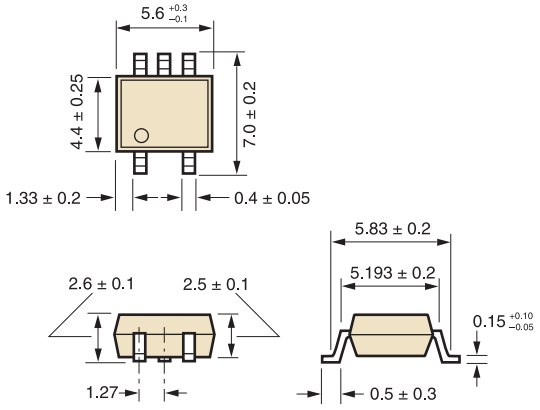
SSOP4 1.27mm pin pitch



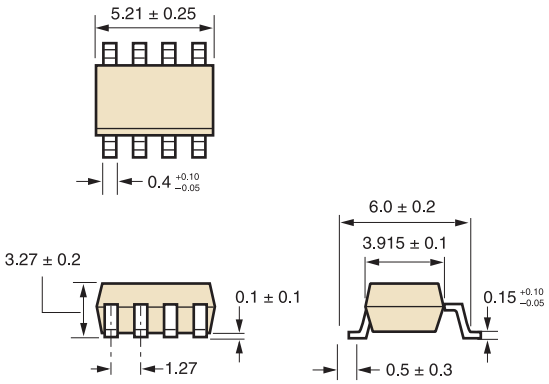
SOP5 1.27mm pin pitch



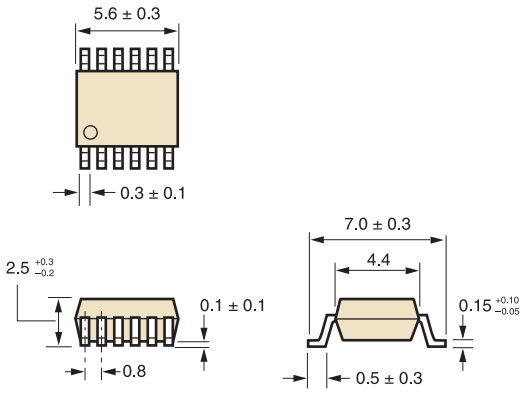
SOP5 1.27mm pin pitch with 5.5mm Creepage



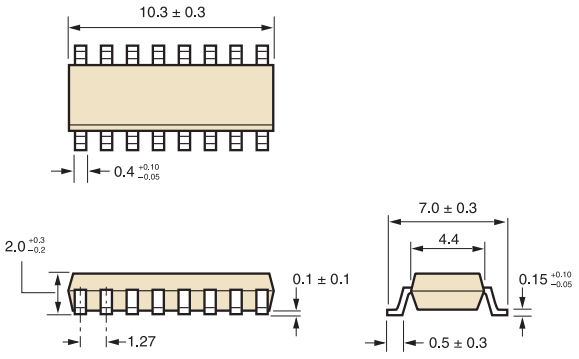
S08 1.27mm pin pitch



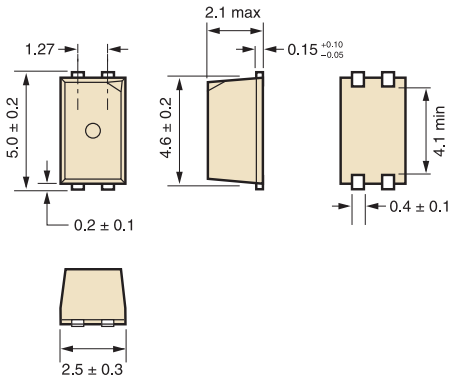
SSOP12 Mini Quad 1.27mm pin pitch



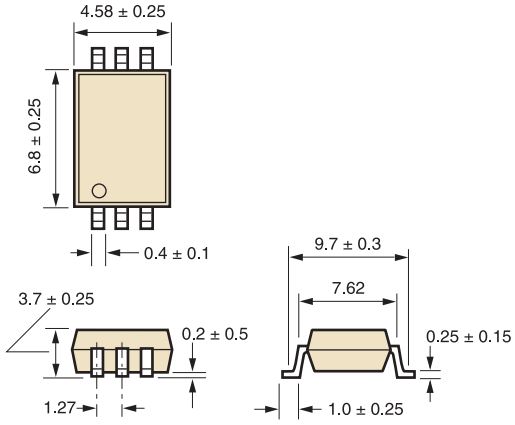
SSOP16 1.27mm pin pitch



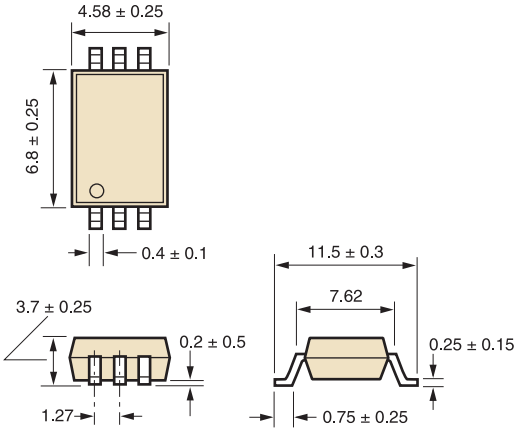
4 Pin Mini Flat



L — SDIP6 SMT Gull Wing

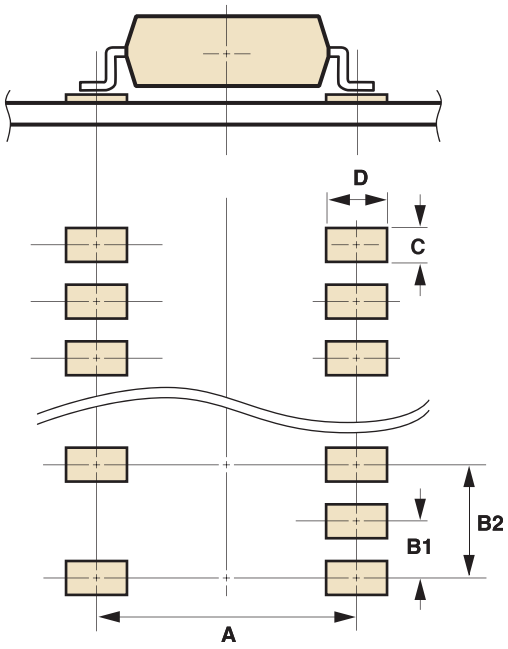


L2 — SDIP6 SMT Gull Wing with 8mm Creepage

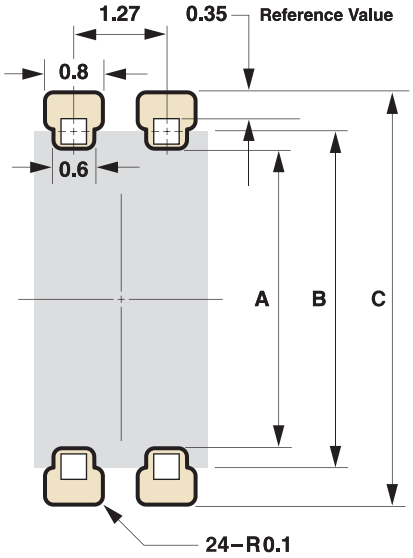


Mounting Pad Dimensions for Optocouplers & Solid State Relays

Package	A	B1	B2	C	D
Surface Mount DIP, SOP and SSOP Packages *(mm)*					
DIP (SMT) 4, 6, 8, 12, 16 Pin	8.2	-	2.54	1.7	2.2
DIP (L2 – SMT) 4, 6, 8, 16 Pin	10.2	-	2.54	1.7	2.2
SOP 4, 8, 16 Pin	6.25	-	2.54	0.8	1.45
SOP 5 Pin	6.25	1.27	2.54	0.8	1.45
SSOP 4, 16 Pin 1.27mm Pitch	6.25	-	1.27	0.8	1.45
SSOP 8 Pin (SO-8) 1.27mm Pitch	5.25	-	1.27	0.8	1.45
SSOP 12 Pin 0.8mm Pitch	6.25	-	0.8	0.5	1.45



Package	A	B	C
Mini Flat Packages *(mm)*			
Optocoupler Version PS29xx, 1.27mm Pitch	4.14	4.7	5.7
SSR Version PS78xx, 1.27mm Pitch	3.6	4.4	5.3



NOTES: The Mini Flat package meets the 4.0mm air distance and outer creepage requirement.

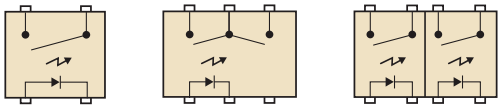
All dimensions are subject to change without notice. Please contact CEL to ensure that you have the latest version of this document.

Renesas Solid State Relays — An Introduction

Solid State Relays (SSRs) are semiconductor-based switching devices that operate optically rather than mechanically. They incorporate three major components: A GaAs LED on the input side, a photovoltaic diode array, and a FET switch on the output side. Renesas Solid State Relays are available in a standard *Normally Open* configuration:

FORM A "Normally Open"

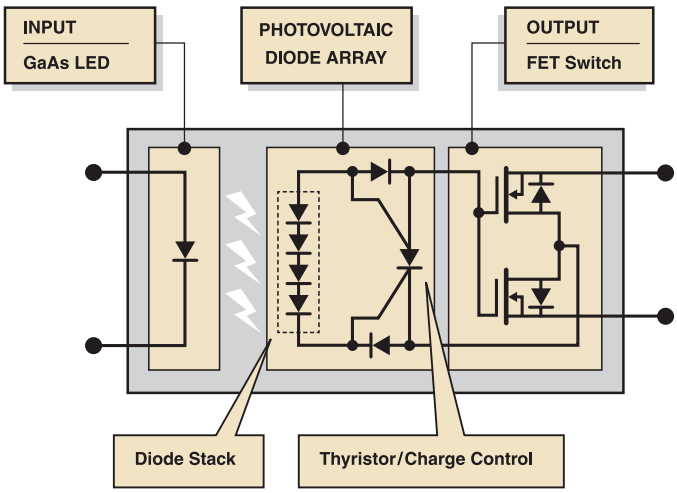
In a FORM A relay, when no input current is present, the FET switch on the output side is nonconductive, or "open." When current is applied, the LED lights and the photovoltaic diode array responds by producing a voltage that's applied to the gates of the FET. When the gates' voltage threshold is reached the FET switch becomes conductive - or closes - effectively switching the relay's load. When the current is removed, the light stops and blocking diodes prevent charge from leaving the gates of the FET.



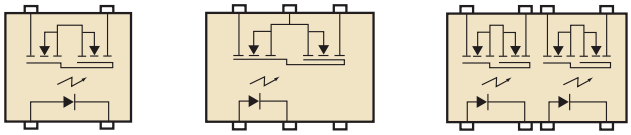
4 Pin 6 Pin 8 Pin Two Channel

As voltage from the photovoltaic array is reduced across the blocking diodes, it reaches a level that triggers a thyristor. The charge is then quickly removed from the gates and the FET goes nonconductive — returning the relay to its *Normally Open* state.

SOLID STATE RELAY: Basic Components



TYPICAL PIN CONFIGURATION



SOP4 & 4 Pin Mini Flat-Lead DIP6 & SMT DIP6 DIP8, SMT DIP8 & SOP8

Why switch from Electro-Mechanical to Solid State Relays?

- **No moving parts**
- **High resistance to shock and vibration**
- **No arcing or contact bounce**
- **No Cross Talk**
- **Extremely fast**
- **Will switch AC or DC, output conduction is unrelated to input current levels**
- **Stable R_{ON} over the life of the device**
- **Proven reliability: 150X better than EMRs**

CEL offers a wide variety of Renesas SSRs for a broad range of applications: These include low CxR devices for high frequency signal control, low RON devices for high current control, and devices designed specifically to handle high voltages. SSR input logic is compatible with a variety of control schemes and can be driven directly by low voltage microcontrollers. With Renesas's broad product offering, it's easy to find an SSR that meets your specific needs.

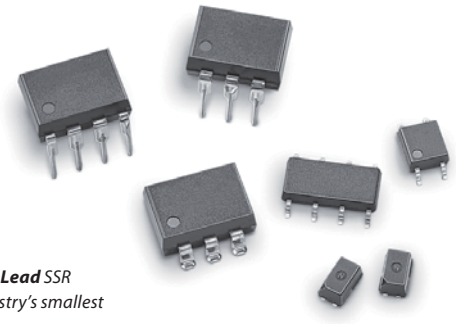
Applications:

- **Telecom/Datacom**
- **Test & Measurement**
- **Programmable Logic Control**
- **Instrumentation**
- **Power Switching**
- **Motor Drive Interfaces**

Package Styles

Renesas SSRs are available in a variety of industry-standard DIP and SOP packages. Many are pin-for-pin compatible with other devices on the market.

For space-constrained designs Renesas offers a number of relays in a 4.6 x 2.64 x 1.85 mm Mini Flat-Lead package. The smallest in the industry, it enables extremely high placement densities, while its shortened signal paths help minimize the parasitic effects of the traces. See pages 36 and 37 for package drawings and dimensions.



Renesas Mini Flat-Lead *SSR package is the industry's smallest*

Manufacturing and Safety Certification

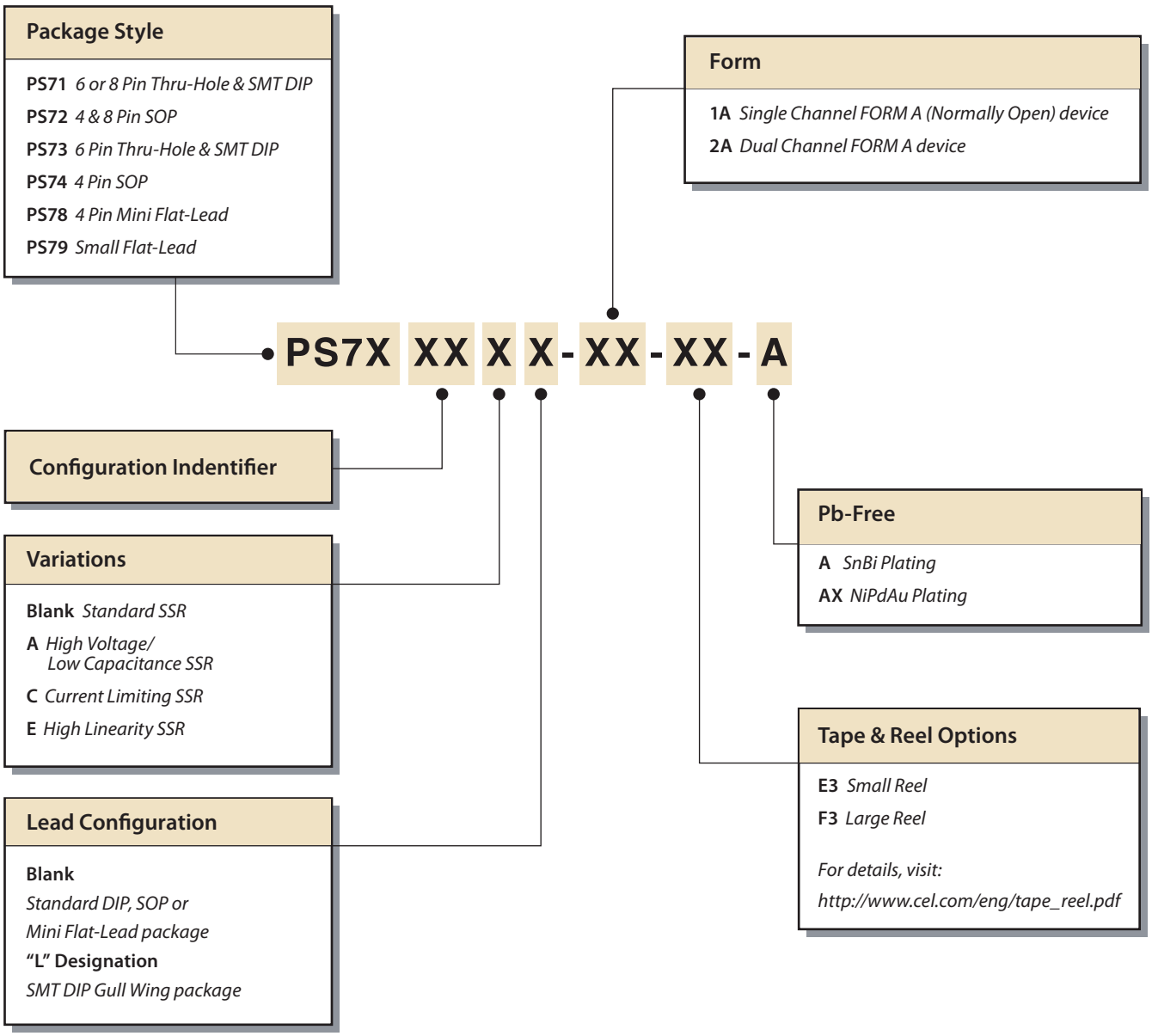
Renesas production line is located at Kyushu Denshi, Japan, where all processes,from initial die loading to final QA and package marking, are fully-automated. This helps to speed production and lower manufacturing costs, while assuring the superior quality and consistency you've come to expect from Renesas.

Renesas SSRs are typically UL, CSA, BSI and VDE Part 2 certified. Other international certifications are also available, please refer to data sheets or contact CEL for specifics.

Renesas Solid State Relay Product Families

POWER and INDUSTRIAL APPLICATIONS	**PS710 Series / PS7113 Series** *High Current, Low RON devices in Thru-Hole and SMT DIP packages* **PS7206, PS7214** *High Current, Low RON devices in SOP4 packages*
TELECOM APPLICATIONS *(Line Voltage)*	**PS7160, PS7360 Series** *600V Load Voltage devices in Thru-Hole and SMT DIP packages* **PS7122 Series** *250V Load Voltage, 200 to 260mA Load Current devices in Thru-Hole and SMT DIP and SOP packages* **PS714x, PS724x, PS734x Series** *400V Load Voltage, 120 - 200mA Load Current devices in Thru-Hole and SMT DIP and SOP packages*
INSTRUMENTATION and ATE *(Automated Test Equipment)*	**PS7200 Series** *Low CxR devices in SOP4 packages* **PS780X Series** *Low CxR devices ultra-miniature Mini Flat-Lead packages*

Renesas Part Numbering System

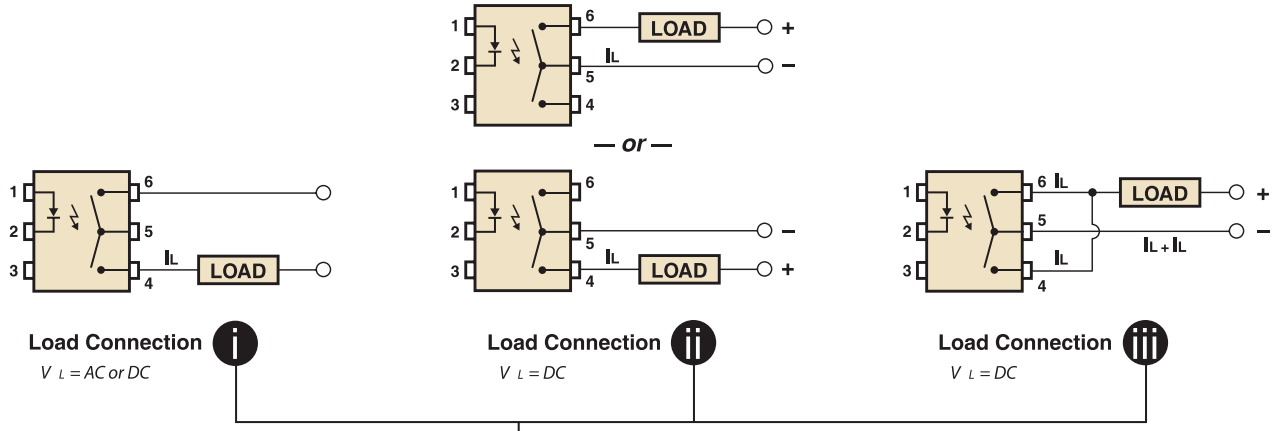


Product Lineup

Function	6-pin DIP (1-ch)	8-pin DIP (2-ch)	4-pin SOP (1-ch)	8-pin SOP (2-ch)	4-pin Flat-Lead
Standard Normally Open	PS7113-1A PS7122A-1A PS7141E-1A PS7142-1A PS7160-1A	PS7113-2A PS7122A-2A PS7141-2A PS7141E-2A PS7142-2A PS7160-2A	PS7241E-1A -	PS7241-2A -	-
Low CxR	-	-	PS7200B-1A PS7200E-1A	-	PS7801E-1A PS7801J-1A PS7801M-1A PS7802A-1A PS7802B-1A
Low On-State Resistance	PS710B-1A PS710E-1A	-	PS720C-1A PS7206-1A PS7214-1A	-	PS7804-1A
Low Offset Voltage	-	-	PS7200A-1A PS7200U-1A	-	PS7801-1A PS7801C-1A PS7801D-1A PS7801F-1A PS7801K-1A
High Isolation Voltage	PS7341-1A PS7342-1A PS7360-1A	-	-	-	-

Renesas Solid State Relays for Power and Industrial Applications

In power and industrial applications, 6 pin SSRs can be configured to switch loads in a variety of ways. The Maximum Load Current specifications in the tables below are provided for these configurations:



Package	Part Number	Form	Max. Load Current I_L (mA)	Max. Load Voltage V_L (V)	Typical Ratings				Safety Certification
					R_{ON} (Ω)	C_{OUT} (pF) Norm. Open	t_{ON} (ms)	t_{OFF} (ms)	
Single Channel, 1500 Vr.m.s. Breakdown Voltage									
DIP6 Thru-Hole SMT DIP6 Gull Wing	**PS710B-1A** **PS710BL-1A**	A	i 2500 ii 3500 iii 5000	60	0.05	500	2.5	0.05	UL, BSI, CSA
DIP6 Thru-Hole SMT DIP6 Gull Wing	**PS710E-1A** **PS710EL-1A**	A	i 2000 ii 3000 iii 4000	80	0.083	480	1.0	0.02	UL
DIP6 Thru-Hole SMT DIP6 Gull Wing	**PS7113-1A** **PS7113L-1A**	A	i 350 ii 450 iii 700	100	0.9	250	1.3	0.06	UL, BSI
DIP6 Thru-Hole SMT DIP6 Gull Wing	**PS7160-1A** **PS7160L-1A**	A	i 90 ii 130 iii 200	600	42	110	0.8	0.06	UL, BSI, CSA
SOP4	**PS720C-1A**	A	1250	60	0.1	230	2.0	0.05	UL
SOP4	**PS7206-1A**		600						
SOP4	**PS7214-1A**		400						
Dual Channel, 1500 Vr.m.s. Breakdown Voltage									
DIP8 Thru-Hole SMT DIP8 Gull Wing	**PS7113-2A** **PS7113L-2A**	A	i 350 ii 450 iii 700	100	0.9	250	1.3	0.06	UL, BSI, CSA
DIP8 Thru-Hole SMT DIP8 Gull Wing	**PS7160-2A** **PS7160L-2A**	A	i 90 ii 130 iii 200	600	42	110	0.8	0.06	UL, BSI, CSA
Single Channel, 3750 Vr.m.s. Breakdown Voltage									
DIP6 Thru-Hole SMT DIP6 Gull Wing	**PS7360-1A** **PS7360L-1A**	A	i 90 ii 130 iii 200	600	41	110	0.6	0.03	UL, BSI, CSA

Renesas Solid State Relays for Telecom Applications

Max Load Current specified using Load Connection ❶ (page 33) See individual data sheets for specifications for Load Connections ⓫ & ⓬

Package	Part Number	Form	Isolation Voltage BV (Vr.m.s.)	Max. Load Current IL (mA)	Typical Ratings				Safety Certification
					RON (Ω)	COUT (pF) Norm. Open	tON (ms)	tOFF (ms)	
Single Channel, 250V Load Voltage									
DIP6 Thru-Hole	**PS7122A-1A** [1]	A	1500	200	4.5	120	0.04	0.5	UL, BSI, CSA
SMT DIP6 Gull Wing	**PS7122AL-1A** [1]								
Two Channel, 250V Load Voltage									
DIP8 Thru-Hole	**PS7122A-2A**	A	1500	200	4.5	120	0.04	0.5	UL, BSI, CSA
SMT DIP8 Gull Wing	**PS7122AL-2A**								
Single Channel, 400V Load Voltage									
DIP6 Thru-Hole	**PS7141E-1A** [2]	A	1500	120	37	36	0.5	0.07	UL, BSI
SMT DIP6 Gull Wing	**PS7141EL-1A** [2]	A							
DIP6 Thru-Hole	**PS7142-1A**	A	1500	200	6	225	0.8	0.02	UL, BSI, CSA
SMT DIP6 Gull Wing	**PS7142L-1A**	A							
SOP4	**PS7241E-1A** [2]	A	1500	120	22	18	0.5	0.07	UL, BSI, VDE
DIP6 Thru-Hole	**PS7341-1A**	A	3750	150	20	65	0.35	0.03	UL, BSI, CSA
SMT DIP6 Gull Wing	**PS7341L-1A**	A							
DIP6 Thru-Hole	**PS7342-1A**	A	3750	200	6	225	1.2	0.06	UL, BSI, CSA, VDE
SMT DIP6 Gull Wing	**PS7342L-1A**	A							
Two Channel, 400V Load Voltage									
DIP8 Thru-Hole	**PS7141-2A**	A	1500	150	20	65	0.35	0.06	UL, BSI, CSA
SMT DIP8 Gull Wing	**PS7141L-2A**	A							
DIP8 Thru-Hole	**PS7141E-2A**	A	1500	100	36	36	0.4	0.07	UL, BSI
SMT DIP8Gull Wing	**PS7141EL-2A**	A							
DIP8 Thru-Hole	**PS7142-2A**	A	1500	200	7.5	140	0.5	0.03	UL, BSI
SMT DIP8 Gull Wing	**PS7142L-2A**	A							
SOP8	**PS7241-2A**	A	1500	120	21	65	0.2	0.02	UL, BSI

NOTES: 1. High Voltage/ Low Capacitance Relay 2. High Linearity Relay

Renesas Solid State Relays for ATE and Instrumentation

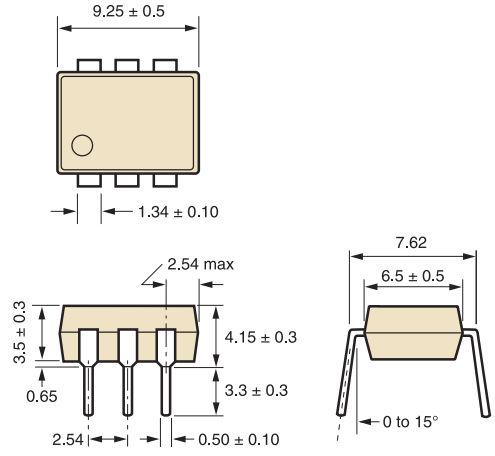
Low CxR, miniature SOP and Mini Flat-Lead packages

Package	Part Number	Form	Max. Load Current I_L (mA)	Max. Load Voltage V_L (V)	Typical Ratings				Safety Certification
					R_{ON} (Ω)	C_{OUT} (pF) Norm. Open	t_{ON} (ms)	t_{OFF} (ms)	
Single Channel, 500 Vr.m.s. Breakdown Voltage									
4 Pin Mini Flat-Lead	**PS7801-1A**	A	100	40	11.5	1.2	0.02	0.15	UL
4 Pin Mini Flat-Lead	**PS7801C-1A**	A	80	30	13	0.5	0.01	0.1	UL
4 Pin Mini Flat-Lead	**PS7801D-1A**	A	120	40	12	0.6	0.01	0.1	UL
4 Pin Mini Flat-Lead	**PS7801E-1A**	A	150	40	1.8	5.0	0.01	0.1	UL
4 Pin Mini Flat-Lead	**PS7801F-1A**	A	130	50	9.5	0.03	0.03	0.05	UL
4 Pin Mini Flat-Lead	**PS7801J-1A**	A	160	20	2.2	1.3	0.05	0.03	UL
4 Pin Mini Flat-Lead	**PS7801K-1A**	A	40	80	17.5	1.6	0.01	0.1	UL
4 Pin Mini Flat-Lead	**PS7801M-1A**	A	160	20	3.3	0.95	0.05	0.03	UL
4 Pin Mini Flat-Lead	**PS7801P-1A**	A	150	40	1.8	5	0.3	0.05	Call
4 Pin Mini Flat-Lead	**PS7802-1A**	A	250	40	1.1	11.5	0.1	0.08	UL
4 Pin Mini Flat-Lead	**PS7802A-1A**	A	250	40	1.1	11.5	0.05	0.05	UL
4 Pin Mini Flat-Lead	**PS7802B-1A**	A	240	40	2.5	2.5	0.2	0.05	
4 Pin Mini Flat-Lead	**PS7804-1A**	A	400	60	1.1	27	0.15	0.05	UL
4 Pin Mini Flat-Lead	**PS7901D-1A**	A	100	40	12	0.75	0.5	0.5	UL
4 Pin Mini Flat-Lead	**PS7902-1A**	A	250	40	1.1	11.5	0.25	0.25	UL
4 Pin Mini Flat-Lead	**PS7904-1A**	A	400	60	1.1	27	0.5	0.5	UL
Single Channel, 1500 Vr.m.s. Breakdown Voltage									
SOP4	**PS7200A-1A**	A	100	40	9.3	3.0	0.01	0.07	UL, BSI, CSA, VDE
SOP4	**PS7200B-1A**	A	250	40	1.0	32	0.05	0.02	UL, BSI, CSA
SOP4	**PS7200E-1A**	A	250	40	0.8	33.5	0.48	0.15	Call
SOP4	**PS7200U-1A**	A	40	80	17	2.3	0.07	0.15	UL, VDE

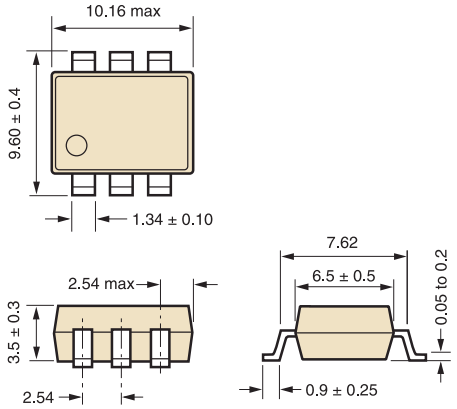
NOTE: Some items on this page display preliminary specifications and may subject to change. 10/2010

Renesas Solid State Relay Packages *Dimensions in millimeters. Dimensions are nominal, please refer to data sheets.*

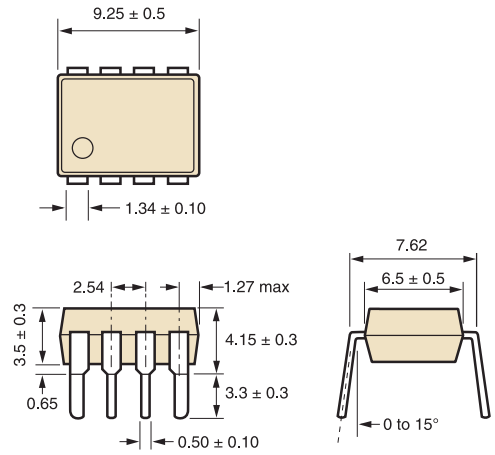
DIP6 Thru-Hole



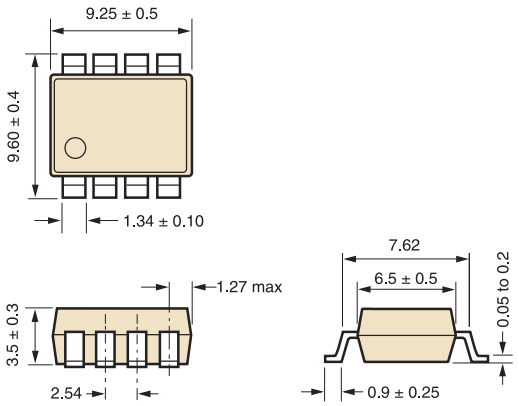
SMT DIP6 Gull Wing



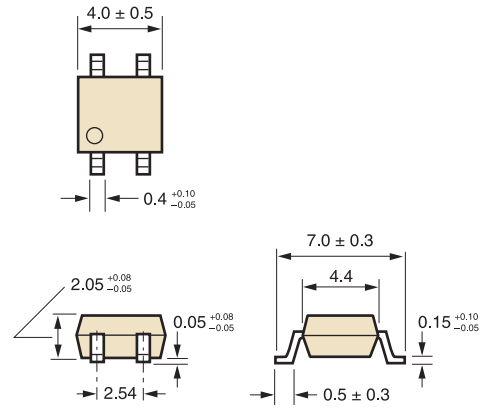
DIP8 Thru-Hole



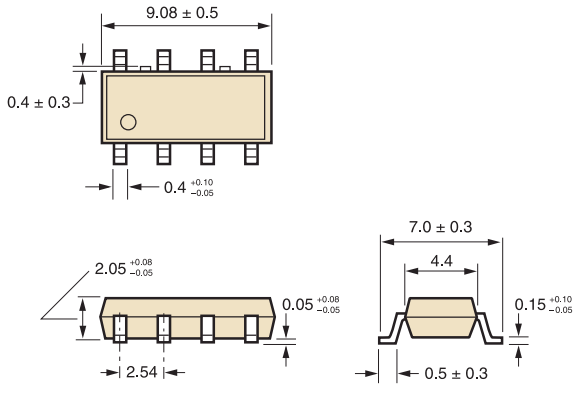
SMT DIP8 Gull Wing



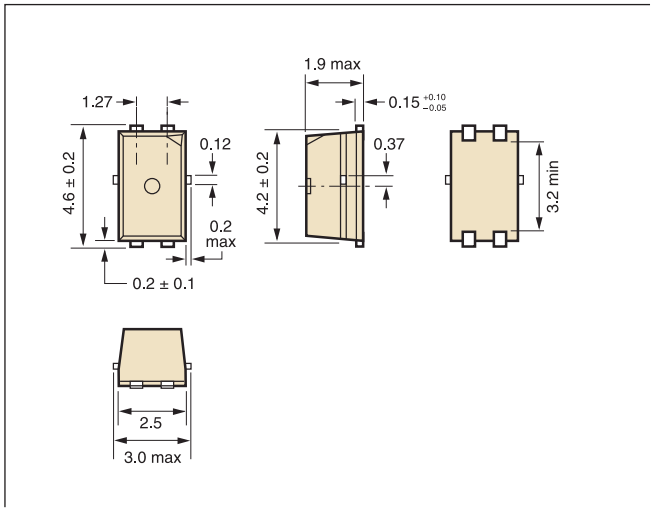
SOP4



SOP8



4 Pin Mini Flat-Lead



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