

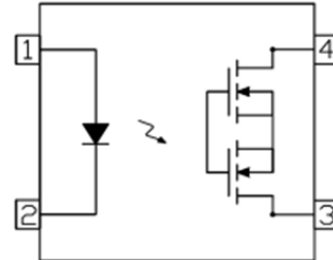


ISP06, ISP25, ISP40, ISP60

DESCRIPTION

The ISP06, ISP25, ISP40 and ISP60 are Single Channel Solid State Relays (Photo MOSFET) each consists of an infrared emitting diode optically coupled to a high voltage output detector. The detector consists of a Photo Voltaic Diode Array and high voltage output MOSFETs.

This Single Channel Output configuration is equivalent to 1 Form A of Electro-mechanical Relay.



FEATURES

- Normally Open Single Pole Single Throw Relay
- High Output Voltages 60V to 600V
- Low ON Resistance
- Low Operating Current
- High AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range
- -40°C to 85°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Industrial Controls
- Telephone/Exchange Equipment
- Measurement Equipment
- FA/OA Equipment
- Security System
- Reed Relay Replacement

ORDER INFORMATION

- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount,
- Add SMT&R after PN for Surface Mount Tape & Reel

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Input Diode

Forward Current	50mA
Reverse Voltage	5V
Forward Peak Current (f=100Hz, Duty Cycle = 0.1%)	1A
Power dissipation	75mW

Output

	ISP06	ISP25	ISP40	ISP60
Output	60	250	400	600
Breakdown Voltage V _L (V)				
Load Current I _L				
Continuous (mA)	550	180	120	50
Pulse (A)	1.2	0.5	0.3	0.15
(100ms, 1 shot, V _L = DC)				
Power Dissipation				500mW

Total Package

Isolation Voltage (R.H. = 40% - 60%, 1 min)	5000V _{RMS}
Total Power Dissipation	550mW
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
Lead Soldering Temperature (10s)	260°C

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ISP06, ISP25, ISP40, ISP60

Truth Table

Input	Output
ON	CLOSE
OFF	OPEN

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 10\text{mA}$		1.18	1.5	V
Reverse Current	I_R	$V_R = 5\text{V}$			1	μA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit	
Off State Leakage Current	I_{leak}	$I_F = 0\text{mA}, V_L = \text{Max}$			1	μA	
On Resistance	$R_{d(\text{ON})}$	$I_F = 10\text{mA}, I_L = \text{Max}, t = 1\text{s}$		ISP06	0.7	2.5	Ω
				ISP25	6.5	15	
				ISP40	20	30	
				ISP60	40	70	
Output Capacitance	C_{out}	$V_L = 0\text{V}, f = 1\text{MHz}$		ISP06	85		pF
				ISP25	60		
				ISP40	45		
				ISP60	30		



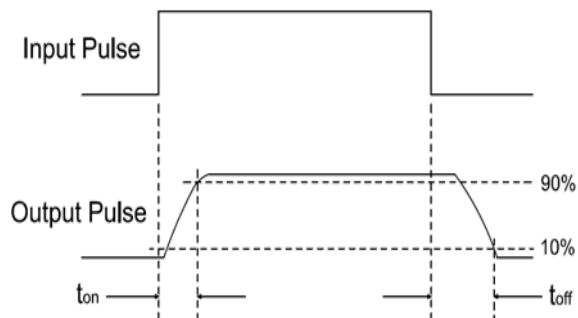
ISP06, ISP25, ISP40, ISP60

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit	
LED Turn On Current	I _{F(on)}	I _L = Max		2.5	5	mA	
LED Turn Off Current	I _{F(off)}	I _L = Max	0.4	2.5		mA	
Turn On Time	T _{on}	I _F = 10mA, I _L = Max, R _L = 200Ω				ms	
			ISP06		1.4		3
			ISP25		1.2		3
			ISP40		0.4		3
ISP60		1.4	3				
Turn Off Time	T _{off}	I _F = 10mA, I _L = Max, R _L = 200Ω				ms	
			ISP06		0.05		0.5
			ISP25		0.05		0.5
			ISP40		0.05		0.5
ISP60		0.05	0.5				
Isolation Resistance	R _{I-O}	V _{I-O} = 500VDC	5 x 10 ¹⁰			Ω	
Isolation Capacitance	C _{I-O}	V = 0V, f = 1MHz		1.5		pF	

Turn on / Turn off Time





ISP06, ISP25, ISP40, ISP60

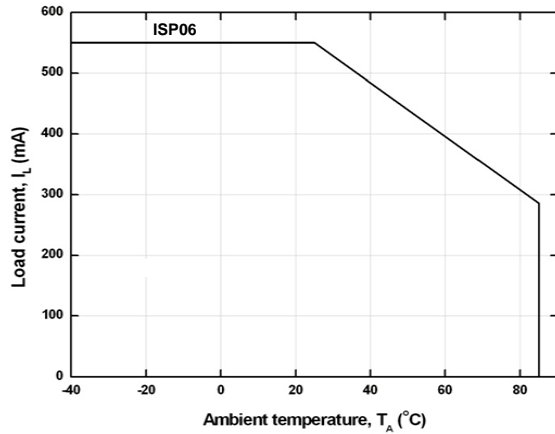


Fig 1a Load Current vs Ambient Temperature

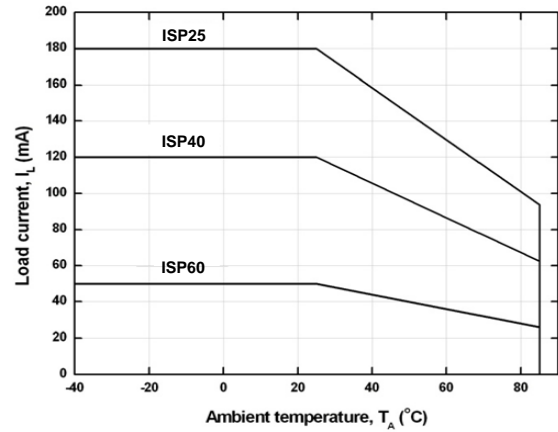


Fig 1b Load Current vs Ambient Temperature

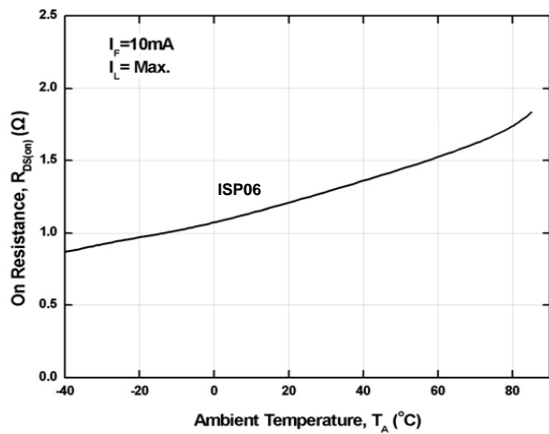


Fig 2a On Resistance vs Ambient Temperature

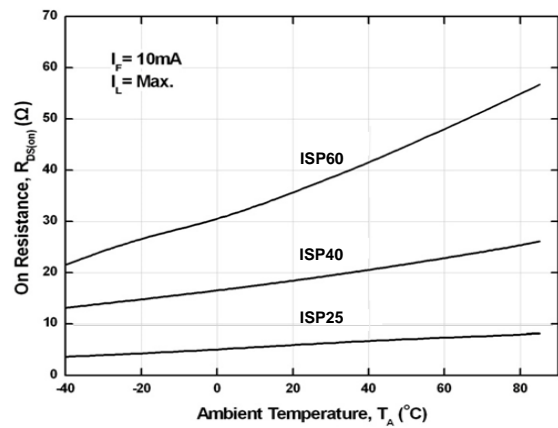


Fig 2b On Resistance vs Ambient Temperature

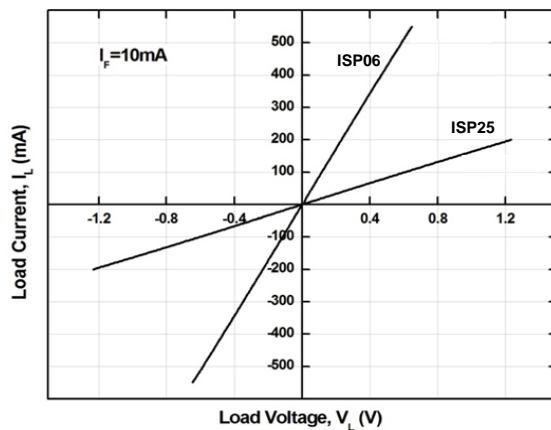


Fig 3a Load Current vs Load Voltage

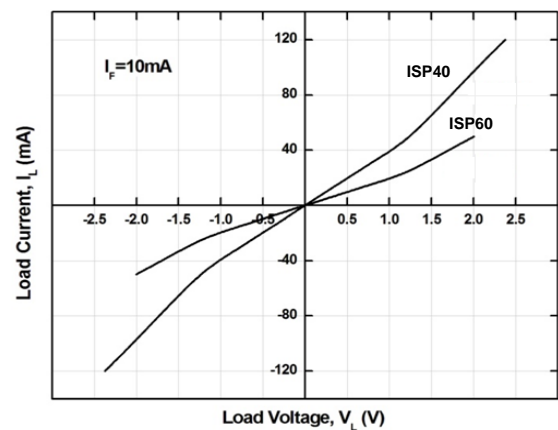


Fig 3b Load Current vs Load Voltage



ISP06, ISP25, ISP40, ISP60

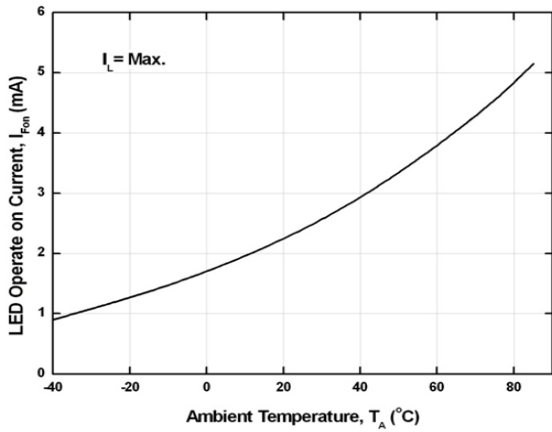


Fig 4 LED Turn On Current vs T_A

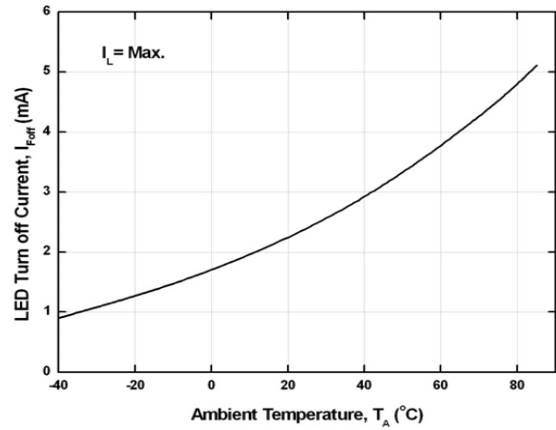


Fig 5 LED Turn Off Current vs T_A

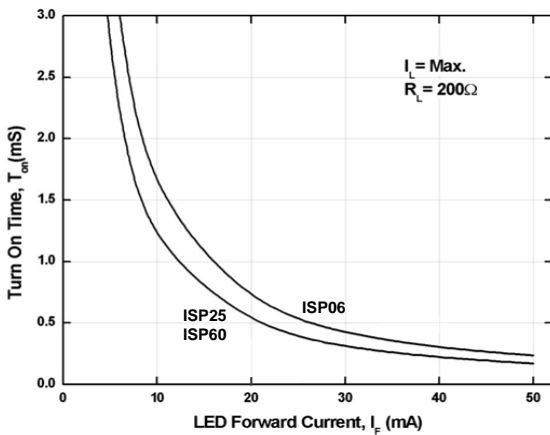


Fig 6a Turn On Time vs LED Forward Current

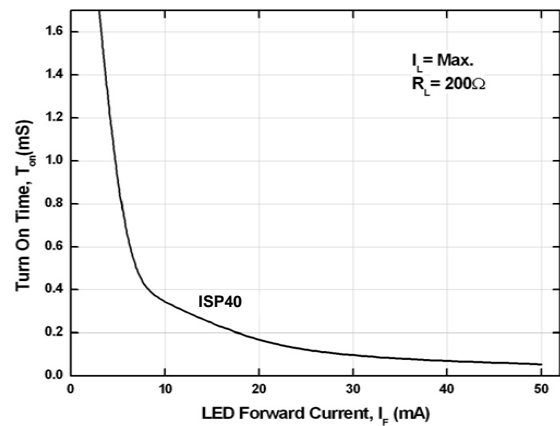


Fig 6b Turn On Time vs LED Forward Current

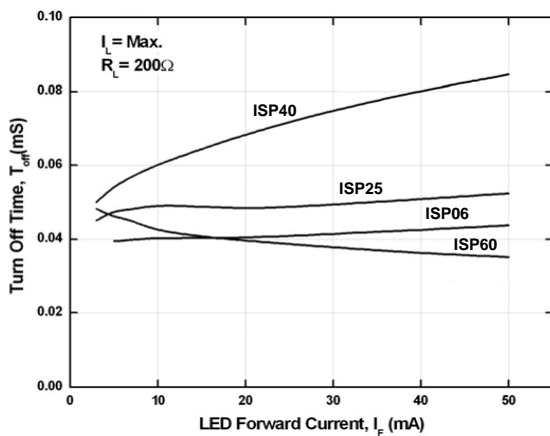


Fig 7 Turn Off Time vs LED Forward Current

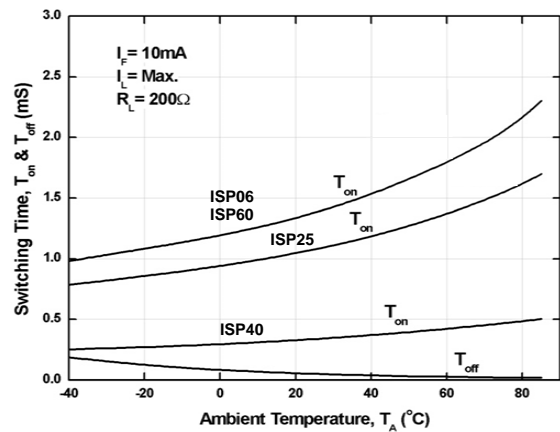


Fig 8 Switching Time vs Ambient Temperature



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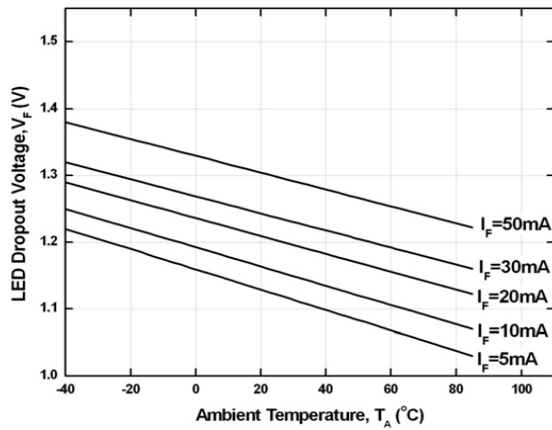


Fig 9 LED Dropout Voltage vs T_A

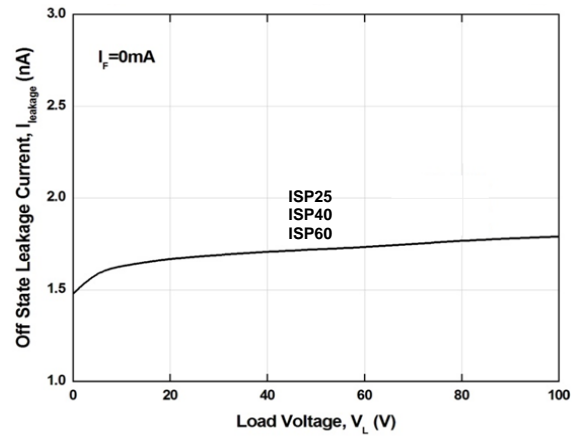


Fig 10 Off State Leakage Current vs Load Voltage

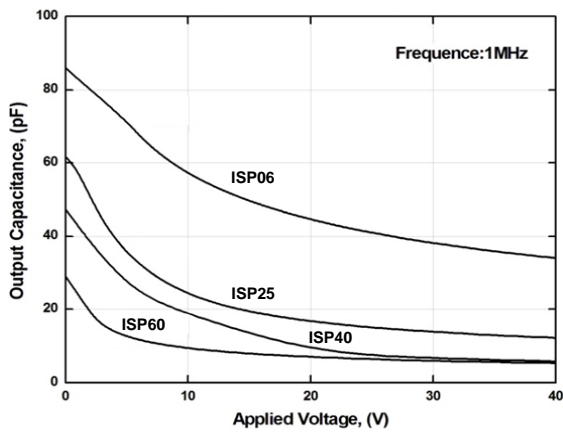


Fig 11 Output Capacitance vs Applied Voltage

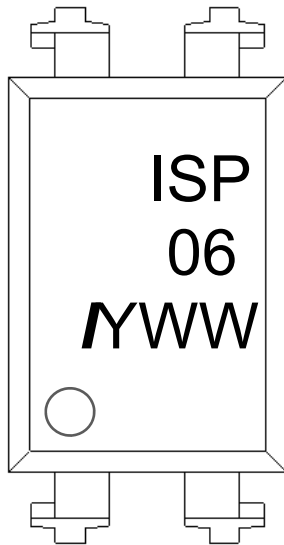


ISP06, ISP25, ISP40, ISP60

ORDER INFORMATION

ISP06, ISP25, ISP40, ISP60			
After PN	PN	Description	Packing quantity
None	ISP06, ISP25, ISP40, ISP60	Standard DIP4	100 pcs per tube
G	ISP06G, ISP25G, ISP40G, ISP60G	10mm Lead Spacing	100 pcs per tube
SM	ISP06SM, ISP25SM, ISP40SM, ISP60SM	Surface Mount	100 pcs per tube
SMT&R	ISP06SMT&R, ISP25SMT&R, ISP40SMT&R, ISP60SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

DEVICE MARKING



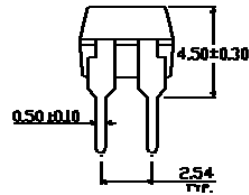
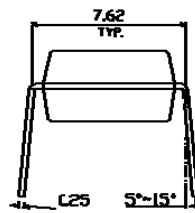
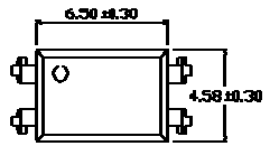
ISP06 denotes Device Part Number (ISP06 is used as example)
I denotes Isocom
Y denotes 1 digit Year code
WW denotes 2 digit Week code



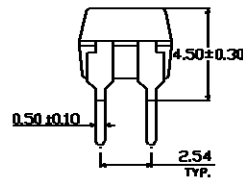
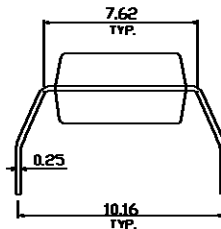
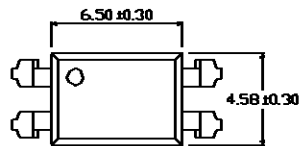
ISP06, ISP25, ISP40, ISP60

PACKAGE DIMENSIONS (mm)

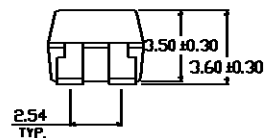
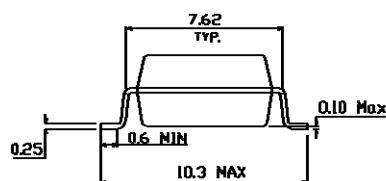
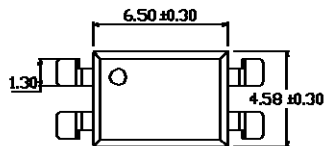
DIP



G Form



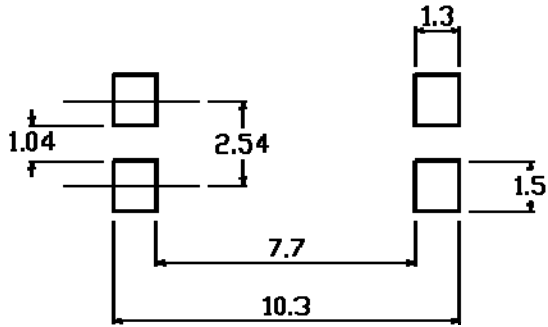
SMD



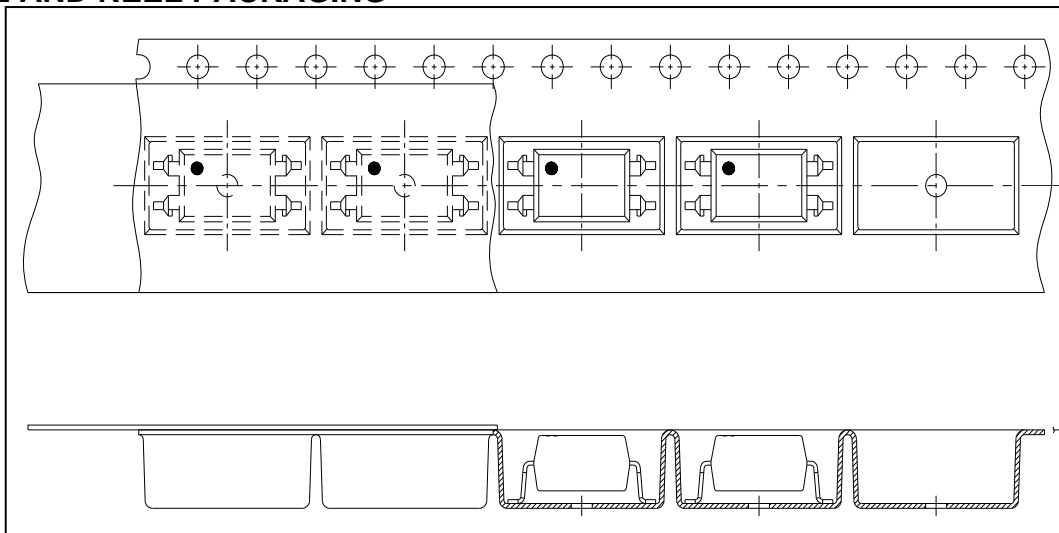


ISP06, ISP25, ISP40, ISP60

RECOMMENDED PAD LAYOUT FOR SMD (mm)



TAPE AND REEL PACKAGING



Direction of feed from reel

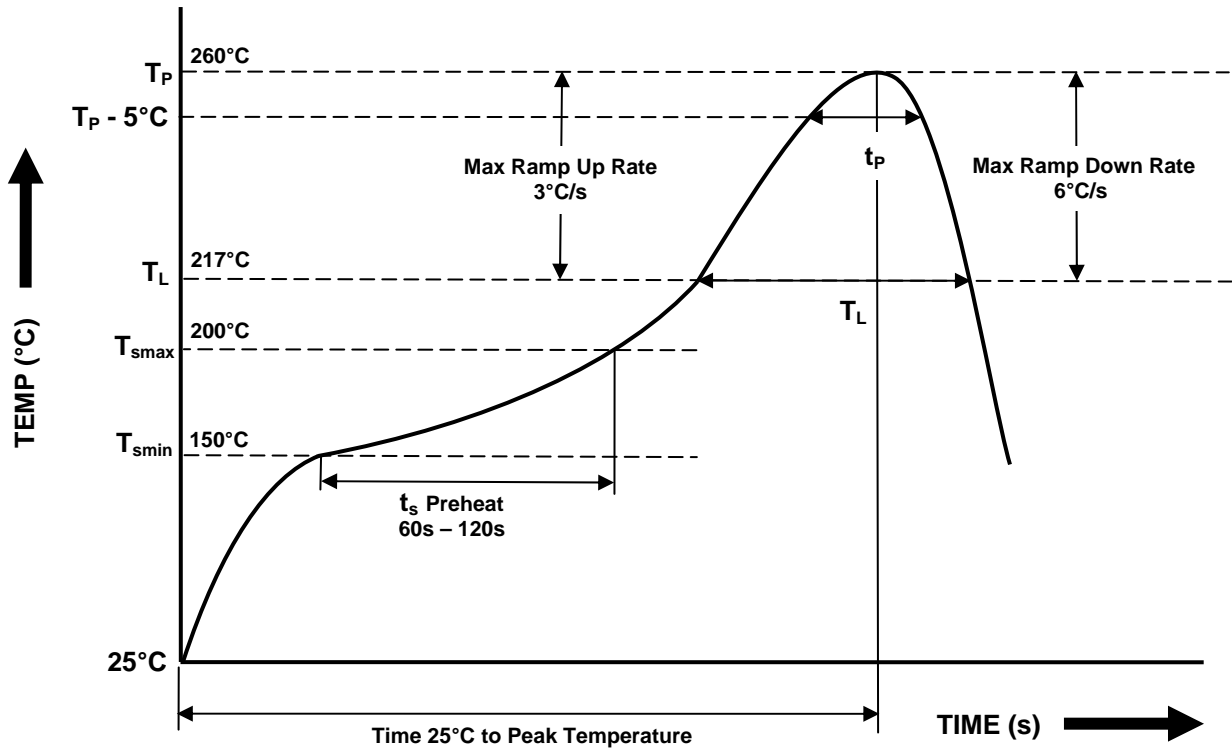


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

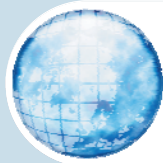


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IR REFLOW SOLDERING TEMPERATURE PROFILE
(One Time Reflow Soldering is Recommended)



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature ($T_P - 5°C$) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	260°C 217°C 30s 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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