

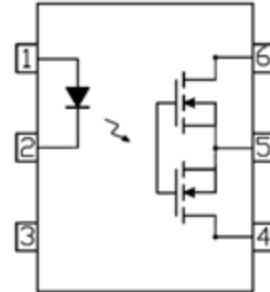


IS06, IS25, IS40, IS60

DESCRIPTION

The IS06, IS25, IS40 and IS60 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. The Solid State Relay can be configured to have AC/DC or DC only operation.

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

	IS06	IS25	IS40	IS60
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	5000 _{RMS}
(R.H. = 40% - 60%, 1 min)	
Total Power Dissipation	550mW
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
Lead Soldering Temperature (10s)	260°C

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
Hartlepool, Cleveland, TS25 1UD, United Kingdom
Tel: +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail: sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office,
Block A, 8/F, Wah Hing Industrial mansion,
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong.
Tel: +852 2995 9217 Fax : +852 8161 6292
e-mail sales@isocom.com.hk



IS06, IS25, IS40, IS60

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	$R_{d(\text{ON})A}$	$I_F = 5\text{mA}, I_L = \text{Max}, t = 1\text{s}$	IS06	0.75	2.5	Ω	
			IS25	6.5	15		
			IS40	20	30		
			IS60	42	70		
	$R_{d(\text{ON})B}$			IS06	0.4		1
				IS25	3		5
				IS40	14		20
				IS60	30		50
	$R_{d(\text{ON})C}$			IS06	0.2		0.5
				IS25	1.5		3
				IS40	7		15
				IS60	15		30

Note : $R_{d(\text{ON})A}$, $R_{d(\text{ON})B}$ and $R_{d(\text{ON})C}$ are specified under corresponding Connection Types.



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

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Output Capacitance	C_{out}	$V_L = 0\text{V}$, $f = 1\text{MHz}$				pF
		IS06		85		
		IS25		60		
		IS40		45		
		IS60		30		

COUPLED

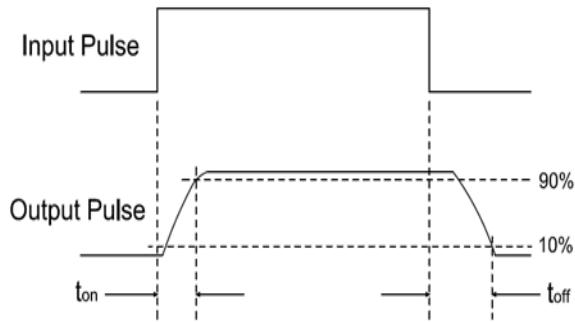
Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
LED Turn On Current	$I_{F(on)}$	$I_L = \text{Max}$		1.5	3	mA
LED Turn Off Current	$I_{F(off)}$	$I_L = \text{Max}$	0.4	1.5		mA
Turn On Time	T_{on}	$I_F = 10\text{mA}$, $I_L = \text{Max}$, $R_L = 200\Omega$				ms
		IS06		1.3	3	
		IS25		1	3	
		IS40		0.35	3	
		IS60		1	3	
Turn Off Time	T_{off}	$I_F = 10\text{mA}$, $I_L = \text{Max}$, $R_L = 200\Omega$				ms
		IS06		0.1	0.5	
		IS25		0.1	0.5	
		IS40		0.1	0.5	
		IS60		0.1	0.5	
Isolation Resistance	R_{L-O}	$V_{L-O} = 500\text{VDC}$	5×10^{10}			Ω
Isolation Capacitance	C_{L-O}	$V = 0\text{V}$, $f = 1\text{MHz}$		1.5		pF



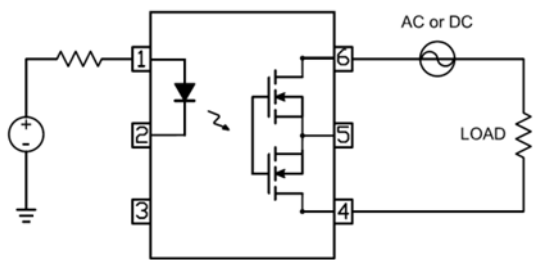
IS06, IS25, IS40, IS60

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

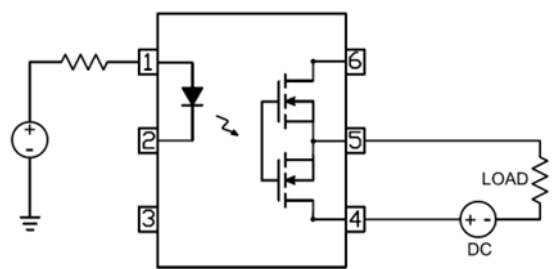
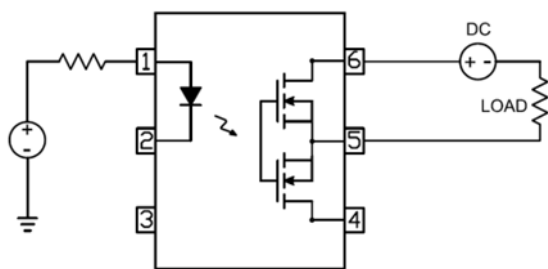
Turn on / Turn off Time



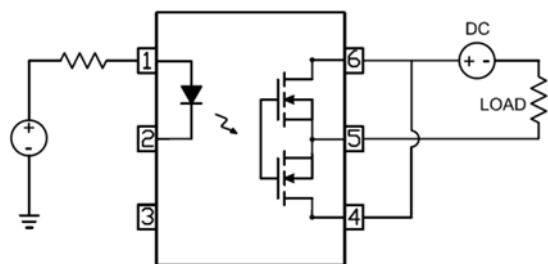
Connection A



Connection B



Connection C





IS06, IS25, IS40, IS60

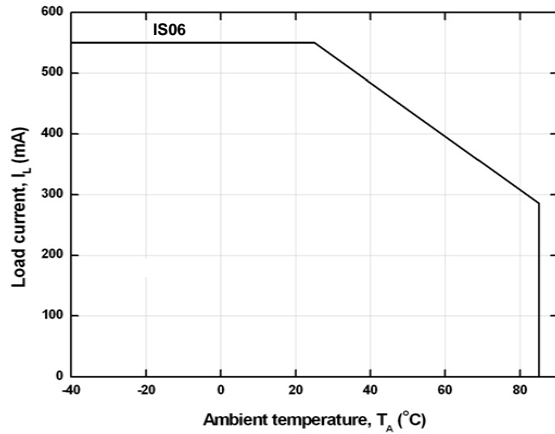


Fig 1a Load Current vs Ambient Temperature

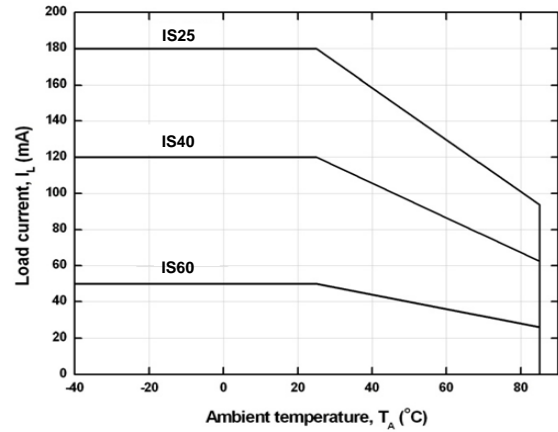


Fig 1b Load Current vs Ambient Temperature

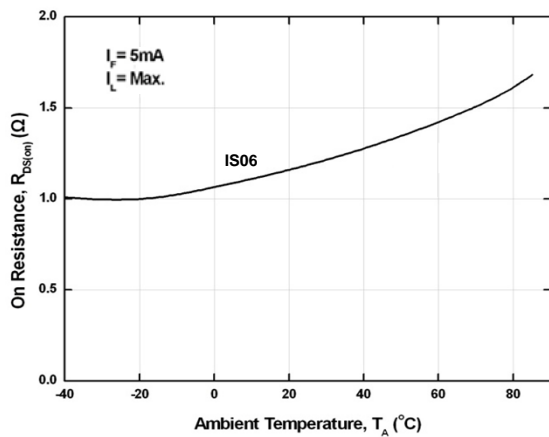


Fig 2a On Resistance vs Ambient Temperature

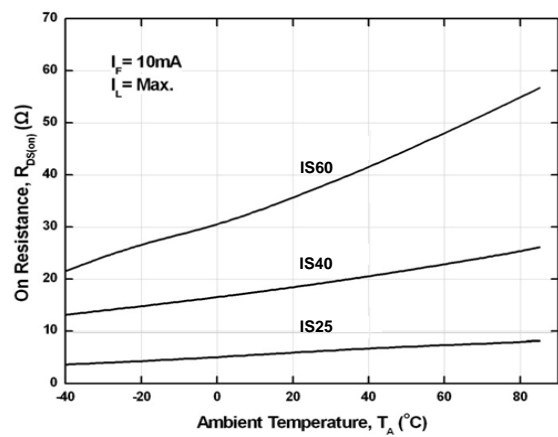


Fig 2b On Resistance vs Ambient Temperature

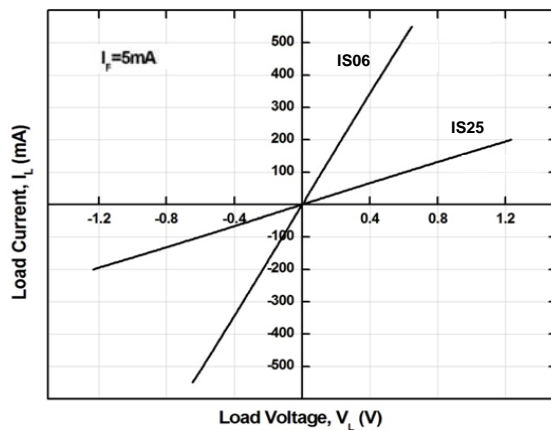


Fig 3a Load Current vs Load Voltage

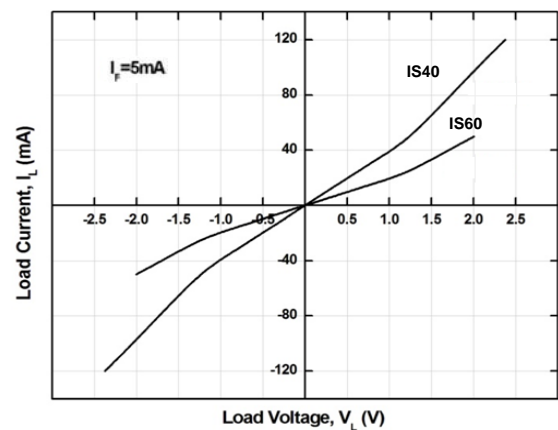


Fig 3b Load Current vs Load Voltage



IS06, IS25, IS40, IS60

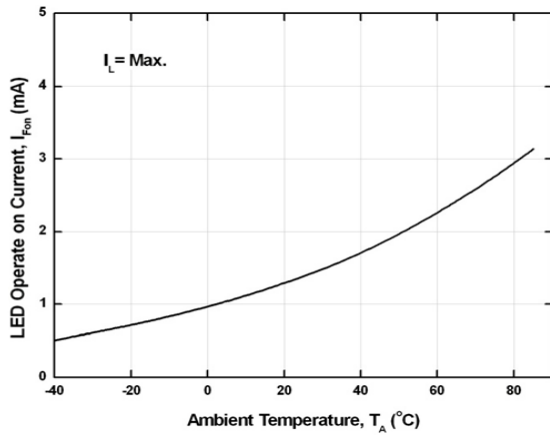


Fig 4 LED Turn On Current vs T_A

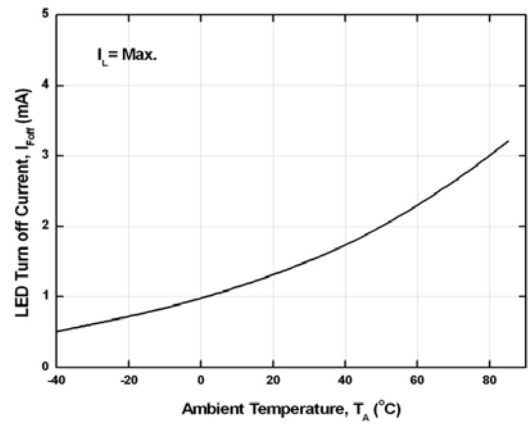


Fig 5 LED Turn Off Current vs T_A

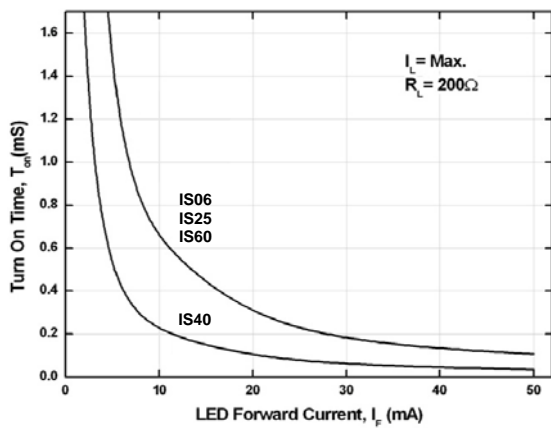


Fig 6 Turn On Time vs LED Forward Current

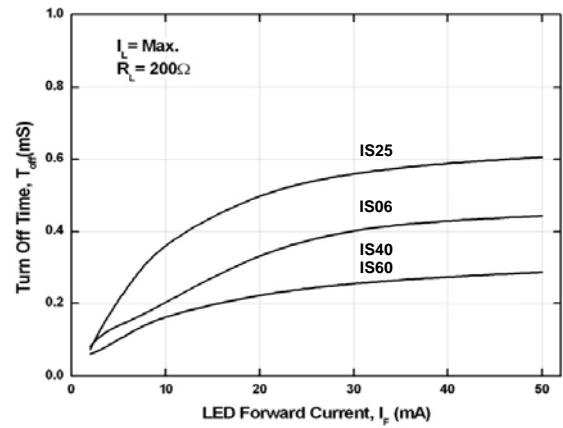


Fig 7 Turn Off Time vs LED Forward Current

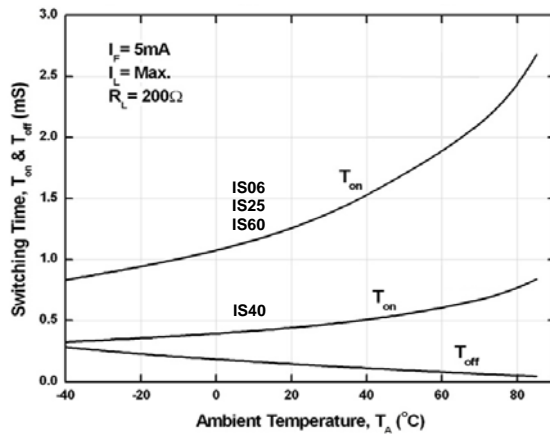


Fig 8 Switching Time vs Ambient Temperature

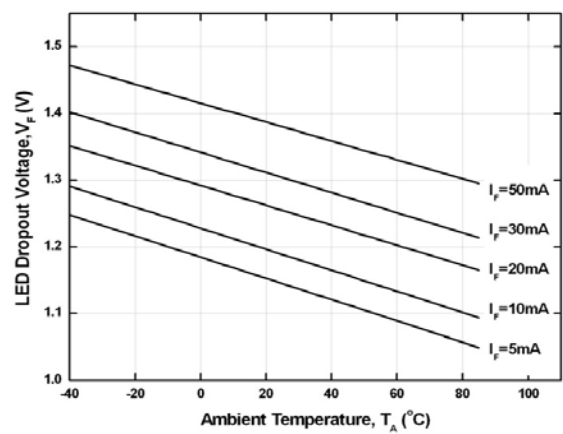


Fig 9 LED Dropout Voltage vs T_A



IS06, IS25, IS40, IS60

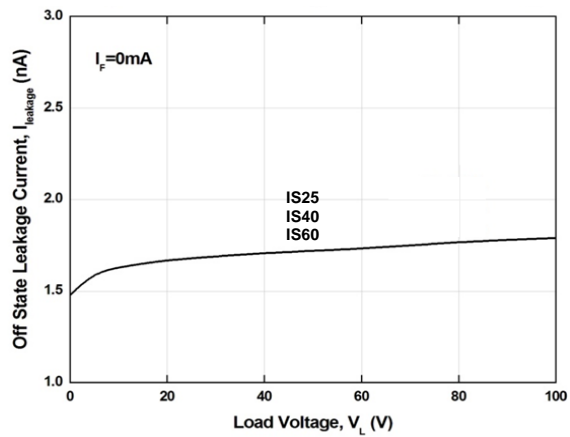


Fig 10 Off State Leakage Current vs Load Voltage

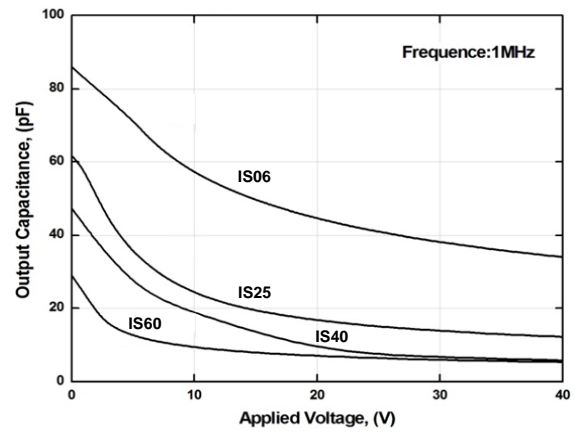


Fig 11 Output Capacitance vs Applied Voltage

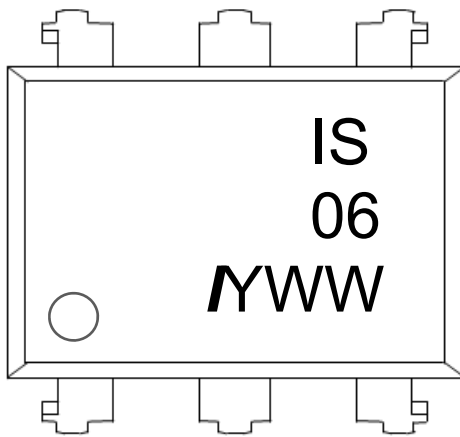


IS06, IS25, IS40, IS60

ORDER INFORMATION

IS06, IS25, IS40, IS60			
After PN	PN	Description	Packing quantity
None	IS06, IS25, IS40, IS60	Standard DIP6	65 pcs per tube
G	IS06G, IS25G, IS40G, IS60G	10mm Lead Spacing	65 pcs per tube
SM	IS06SM, IS25SM, IS40SM, IS60SM	Surface Mount	65 pcs per tube
SMT&R	IS06SMT&R, IS25SMT&R, IS40SMT&R, IS60SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

DEVICE MARKING



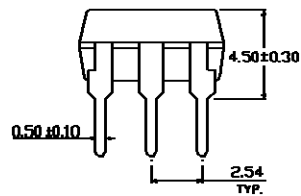
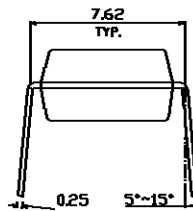
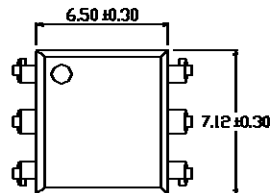
- IS06 denotes Device Part Number (IS06 is used as example)
- I denotes Isocom
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code



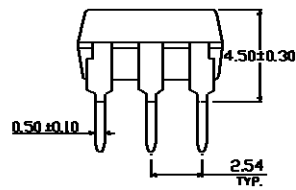
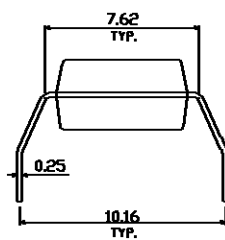
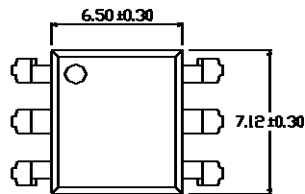
IS06, IS25, IS40, IS60

PACKAGE DIMENSIONS (mm)

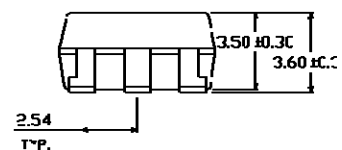
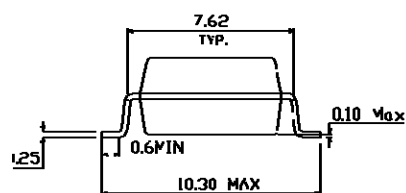
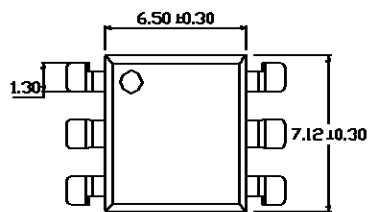
DIP



G Form

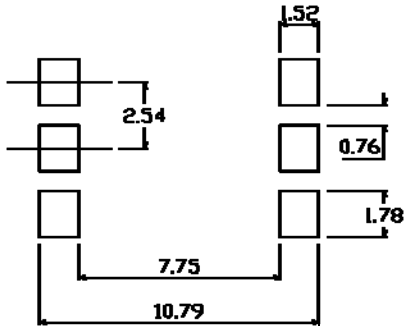


SMD

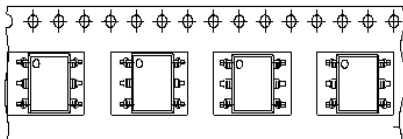




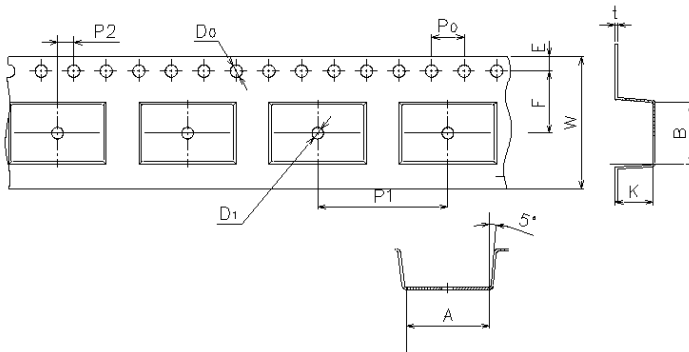
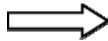
RECOMMENDED PAD LAYOUT FOR SMD (mm)



TAPE AND REEL PACKAGING



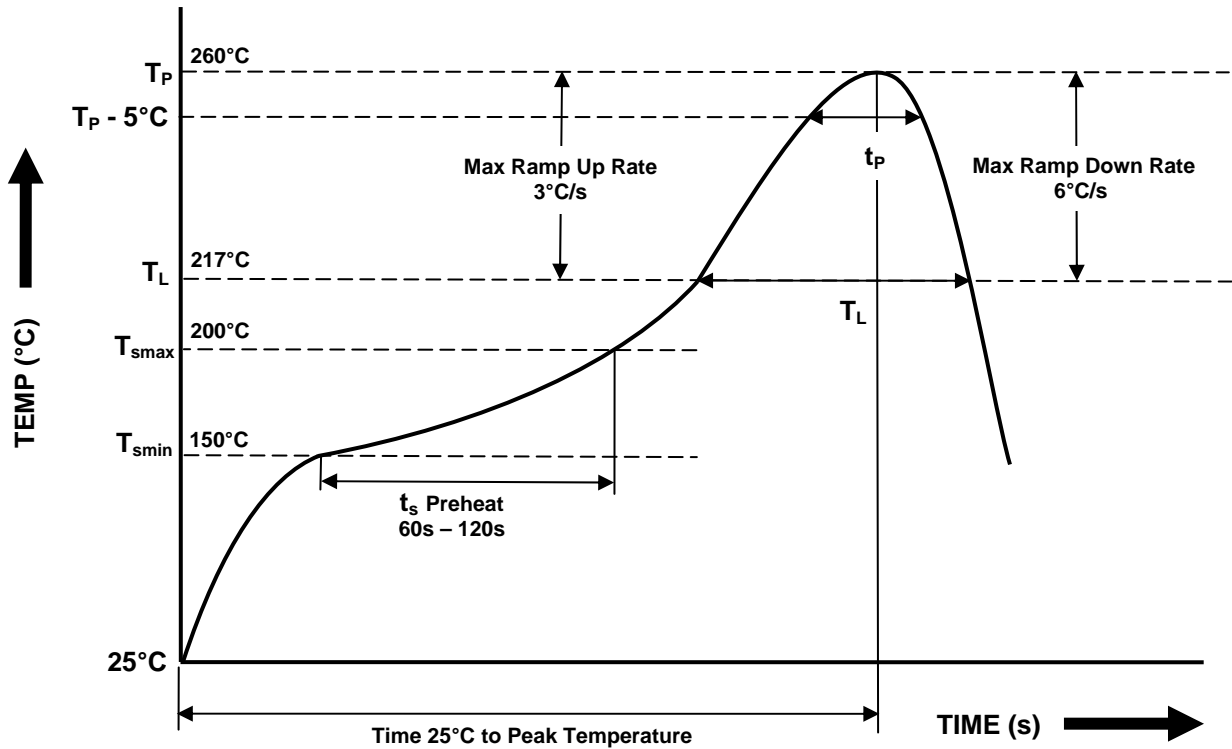
Direction of feed from reel



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	12.0±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1



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



Profile Details	Conditions
Preheat <ul style="list-style-type: none"> - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s) 	150°C 200°C 60s - 120s
Soldering Zone <ul style="list-style-type: none"> - 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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