



## IS180

### DESCRIPTION

The IS180 series of optically coupled isolator consist of two infrared light emitting diodes in reverse parallel connection and optically coupled to an NPN silicon photo transistor in a space efficient Mini Flat Package.

### FEATURES

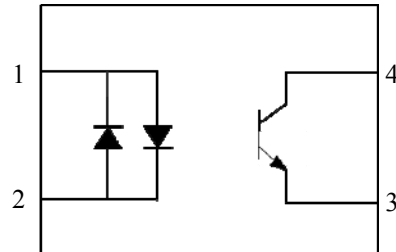
- AC Isolation Voltage 3750V<sub>RMS</sub>
- Wide Operating Temperature Range -55°C to +100°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "FPA"

### APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- System Appliances

### ORDER INFORMATION

- Available in Tape and Reel with 3000pcs per reel



### ABSOLUTE MAXIMUM RATINGS

#### Input Diode

Forward Current	±50mA
Reverse Voltage	6V
Power dissipation	70mW

#### Output Transistor

Collector to Emitter Voltage $BV_{CEO}$	35V
Emitter to Collector Voltage $BV_{ECO}$	6V
Collector Current	50mA
Power Dissipation	150mW

#### Total Package

Operating Temperature	-55 to +100 °C
Storage Temperature	-55 to +150 °C
Total Power Dissipation	170mW
Lead Soldering Temperature (for 10s)	260°C

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## IS180

### ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

#### INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = \pm 20\text{mA}$		1.2	1.4	V
Terminal Capacitance	$C_t$	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

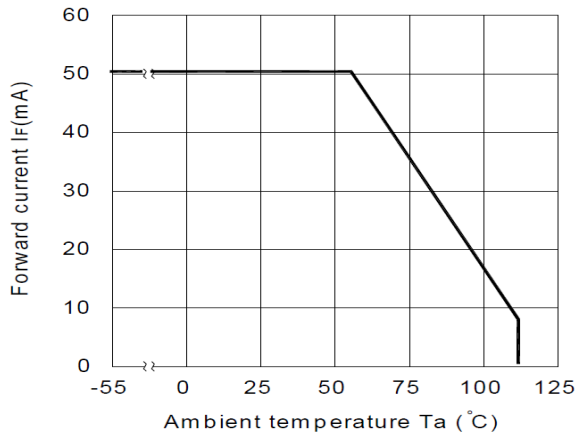
#### OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector—Emitter breakdown Voltage	$BV_{CEO}$	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	35			V
Emitter—Collector breakdown Voltage	$BV_{ECO}$	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

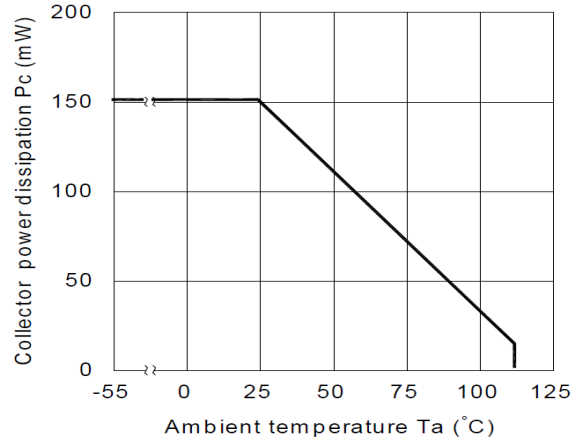
#### COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	20		400	%
		Optional CTR Grades A	50		150	
Collector—Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$			0.2	V
Input to Output Isolation Voltage	$V_{ISO}$	Note 1	3750			$V_{RMS}$
Input to Output Isolation Resistance	$R_{ISO}$	$V_{IO} = 500\text{V}$ Note 1	$5 \times 10^{10}$			$\Omega$
Floating Capacitance	$C_f$	$V = 0\text{V}, f = 1\text{MHz}$		0.5	1	pF
Output Rise Time	$t_r$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$		4	18	$\mu\text{s}$
Output Fall Time	$t_f$			3	18	$\mu\text{s}$

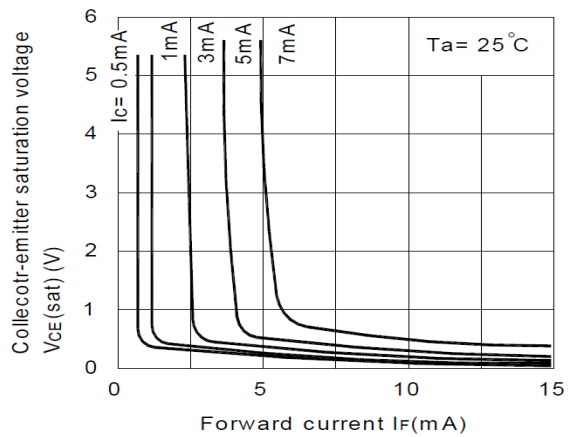
Note 1 : Measure with input leads shorted together and output leads shorted together.



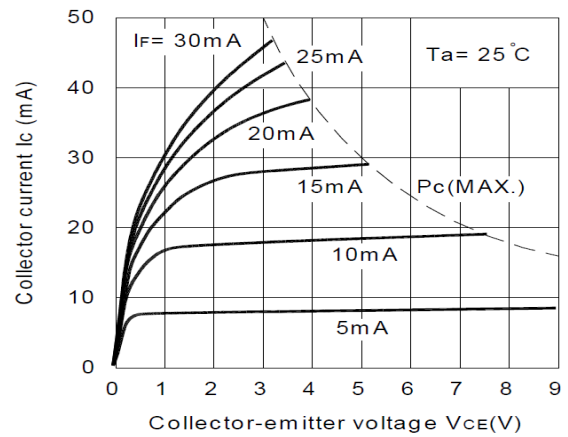
**Fig 1 Forward Current vs  $T_A$**



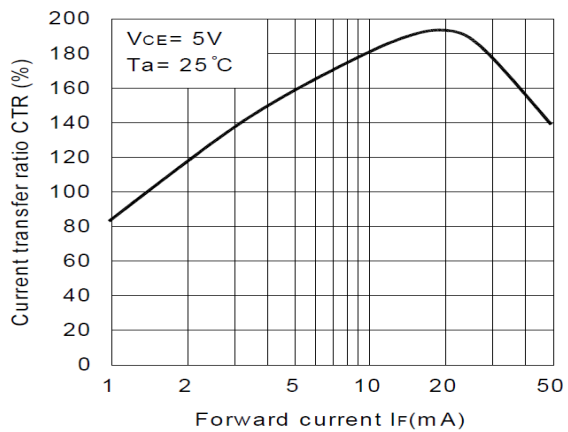
**Fig 2 Collector Power Dissipation vs  $T_A$**



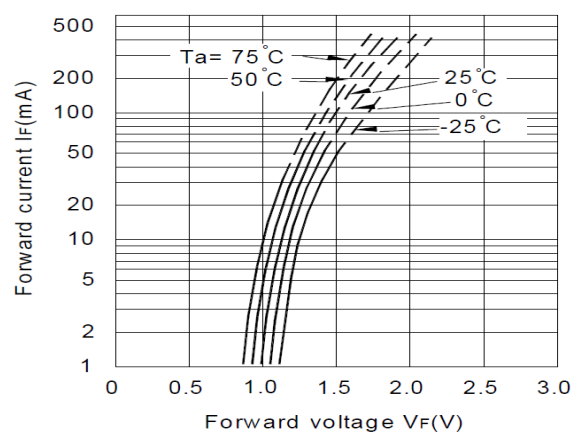
**Fig 3 Collector-emitter Saturation Voltage vs Forward Current**



**Fig 4 Collector Current vs Collector-emitter Voltage**



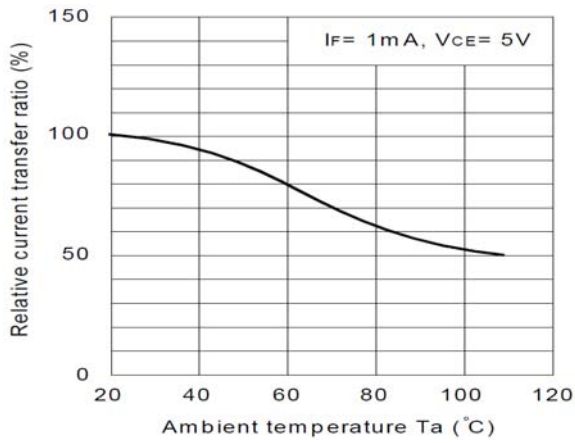
**Fig 5 Current Transfer Ratio vs Forward Current**



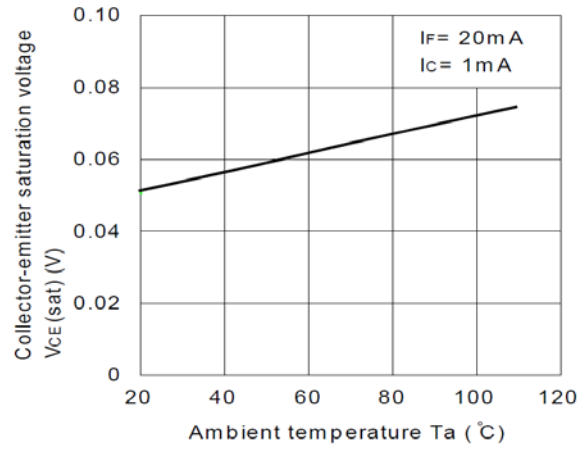
**Fig 6 Forward Current vs Forward Voltage**



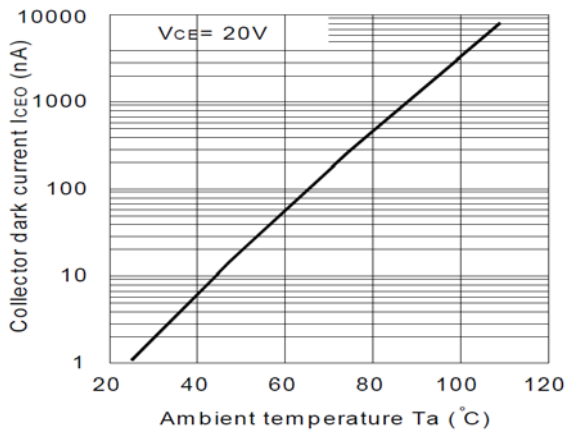
**IS180**



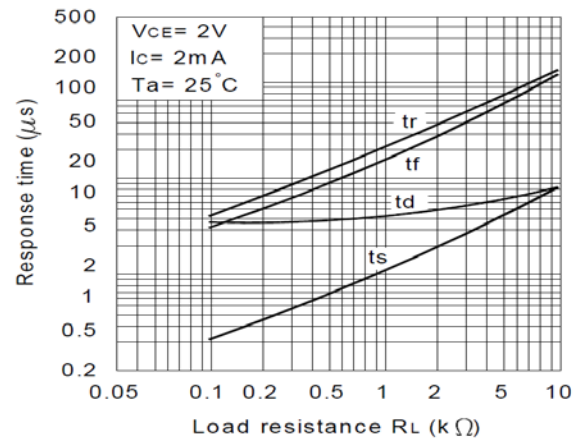
**Fig 7 Relative CTR vs  $T_A$**



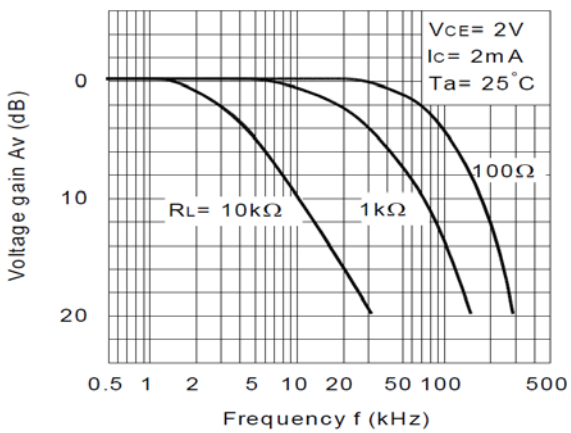
**Fig 8 Collector-emitter Saturation Voltage vs  $T_A$**



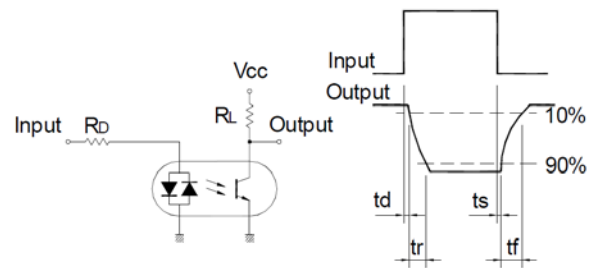
**Fig 9 Collector Dark Current vs  $T_A$**



**Fig 10 Response Time vs Load Resistance**



**Fig 11 Frequency Response**



**Response Time Test Circuit**

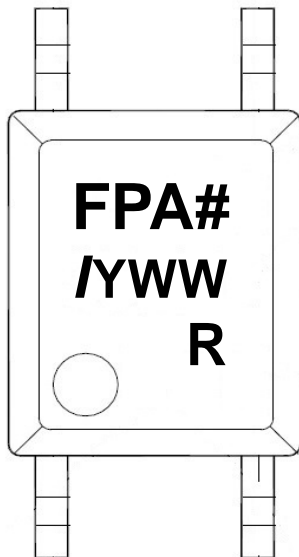


## IS180

### STANDARD PACKING QUANTITY

IS180			
After PN	PN	Description	Packing quantity
None	IS180, IS180A	Surface Mount Tape & Reel	3000 pcs per reel

### DEVICE MARKING

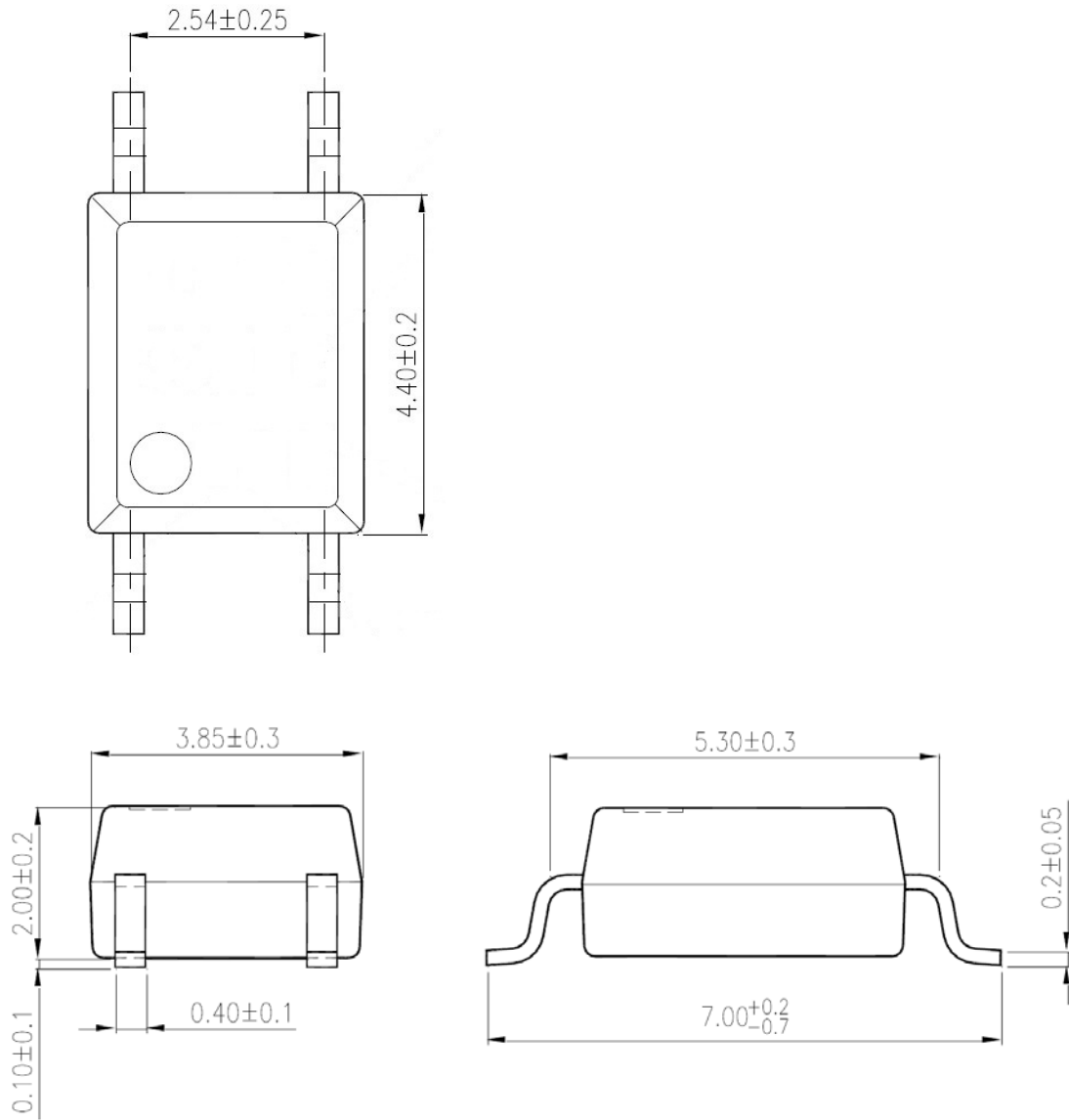


FPA# denotes Device Part Number where “#” is internal control number  
/ denotes Isocom  
Y denotes 1 digit Year code  
WW denotes 2 digit Week code  
R denotes CTR Grade



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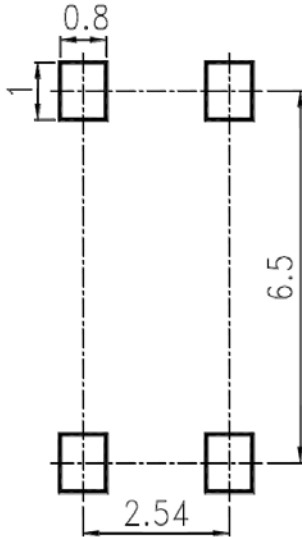
### PACKAGE DIMENSIONS (mm)



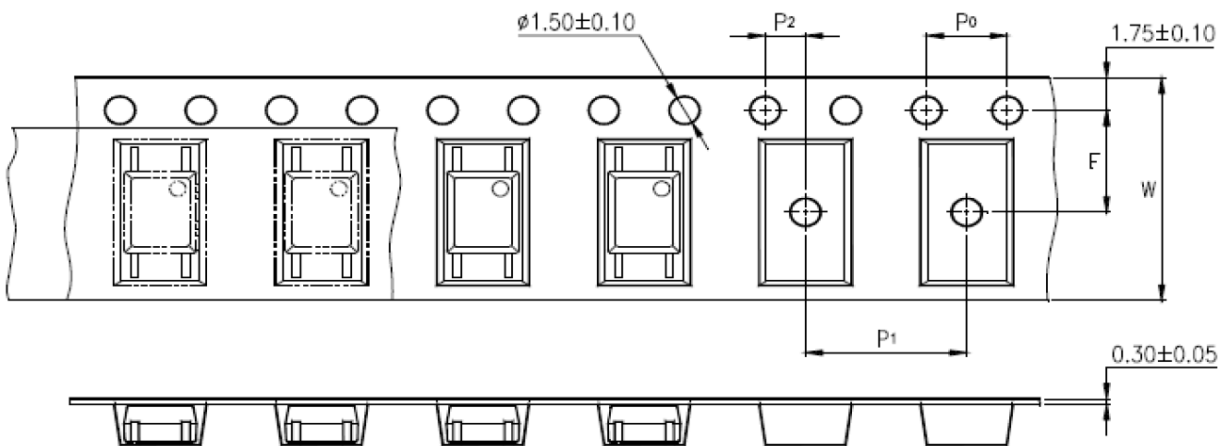


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### RECOMMENDED SOLDER PAD LAYOUT (mm)



### TAPE AND REEL PACKAGING

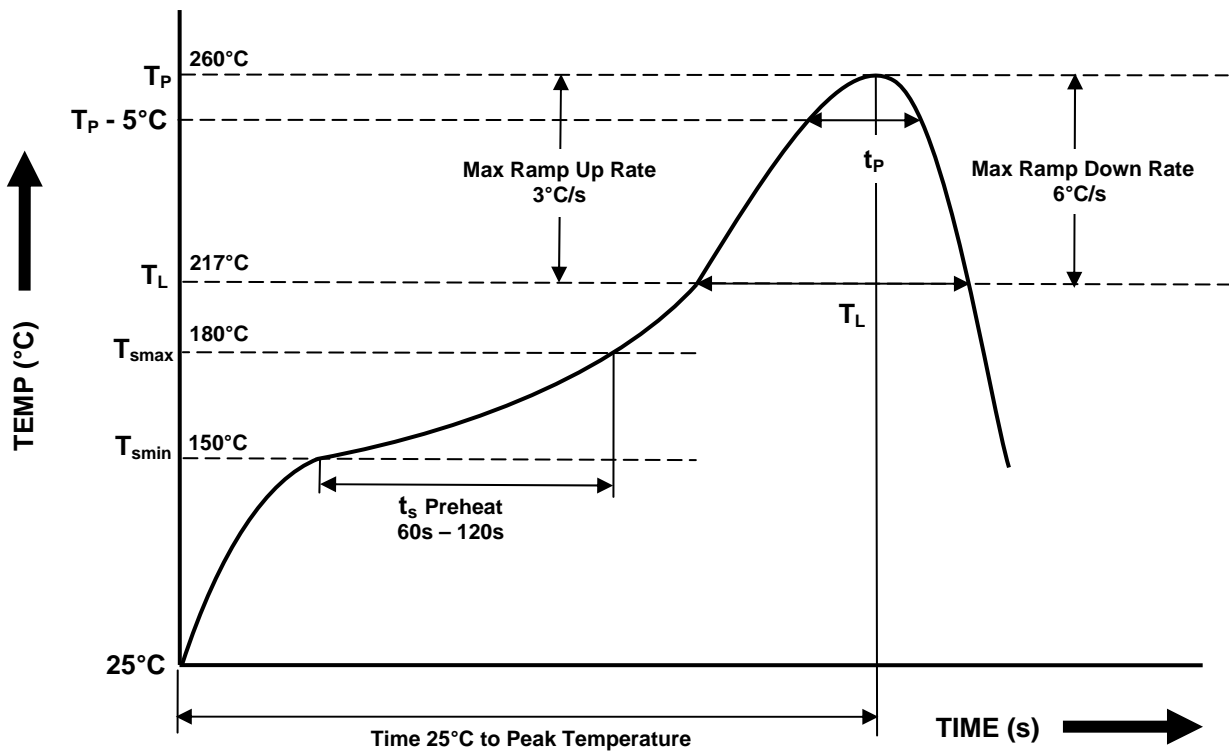


Description	Symbol	Dimensions in mm ( inches )
Tape wide	W	$12 \pm 0.3$ ( .47 )
Pitch of sprocket holes	$P_0$	$4 \pm 0.1$ ( .15 )
Distance of compartment	F	$5.5 \pm 0.1$ ( .217 )
	$P_2$	$2 \pm 0.1$ ( .079 )
Distance of compartment to compartment	$P_1$	$8 \pm 0.1$ ( .315 )



**IS180**

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



Profile Details	Conditions
<b>Preheat</b> - Min Temperature ( $T_{SMIN}$ ) - Max Temperature ( $T_{SMAX}$ ) - Time $T_{SMIN}$ to $T_{SMAX}$ ( $t_s$ )	150°C 180°C 60s - 120s
<b>Soldering Zone</b> - 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 20s 60s 3°C/s max 3 - 6°C/s
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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- For equipment/application where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc., please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales for advice.
- The contents described herein are subject to change without prior notice.
- Do not immerse device body in solder paste.



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