MOC8030, MOC8050

DESCRIPTION

The MOC8030 and MOC8050 series optocoupler consists of an infrared emitting diode optically coupled to an NPN silicon photodarlington with the base pin unconnected in a standard 6 pin dual in line plastic package.

FEATURES

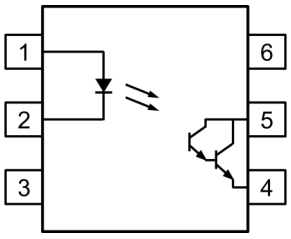
- High AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range −55°C to 110°C
- Base pin unconnected for improved Noise Immunity in high EMI environment
- RoHS Compliant
- UL Approval E91231 Model “SS”
- VDE Approval 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measurement Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add Suffix “X” for VDE Approval
- 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



1 Anode
2 Cathode
3 NC
4 Emitter
5 Collector
6 NC

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.
Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	50mA
Reverse Voltage	6V
Power Dissipation	70mW

Output

Collector Current	80mA
Collector to Emitter Voltage V_{CEO}	80V
Emitter to Collector Voltage V_{ECO}	6V
Power Dissipation	150mW

Total Package

Total Power Dissipation	170mW
Isolation Voltage	5000V_{RMS}
Operating Temperature	−55 to 110°C
Storage Temperature	−55 to 125°C
Junction Temperature	125°C
Lead Soldering Temperature (10s)	260°C

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 10mA		1.2	1.4	V
Reverse Current	I_R	V_R = 4V			10	µA
Terminal Capacitance	C_t	V_F = 0V, f = 1MHz		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C = 1mA, I_F = 0mA	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	6			V
Collector Dark Current	I_{CEO}	V_{CE} = 10V, I_F = 0mA			1000	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	I_F =10mA, V_{CE} = 1.5V MOC8030 MOC8050	 300 500			%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 20mA, I_C = 5mA			1.0	V
Floating Capacitance	C_f	V_{IO} = 0V, f = 1MHz		0.6	1	pF
Cut-Off Frequency	f_C	V_{CE} = 2V, I_C = 20mA R_L = 100Ω, −3dB		6		kHz
Output Rise Time	t_r	V_{CE} = 2V, I_C = 10mA R_L = 100Ω		60	250	µs
Output Fall Time	t_f			53	250	µs

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

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, t = 1 min Note 1	5000			V_{RMS}
Isolation Resistance	R_{ISO}	V_{I-O} = 500VDC R.H. = 40% to 60% Note 1	$5x10^{10}$	$1x10^{11}$		Ω

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

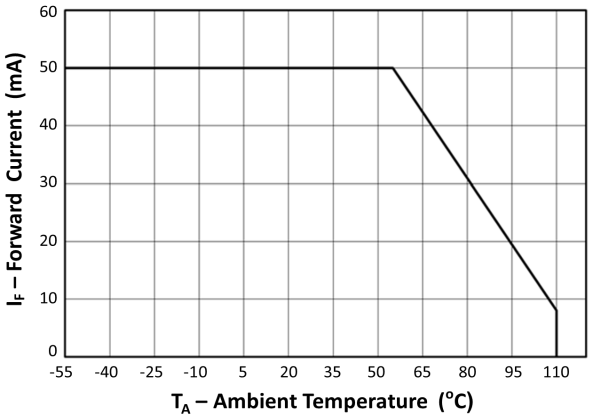


Fig 1 Forward Current vs Ambient Temperature

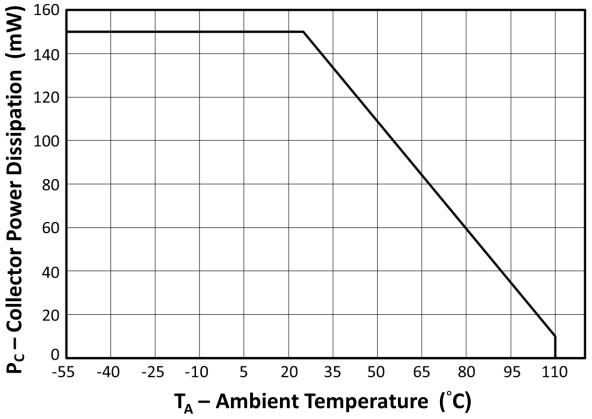


Fig 2 Collector Power Dissipation vs Ambient Temperature

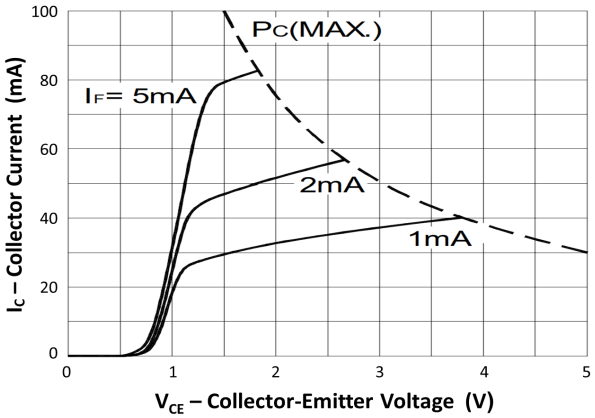


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

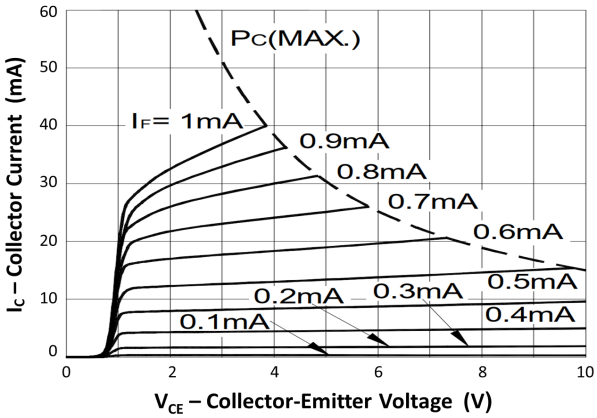


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

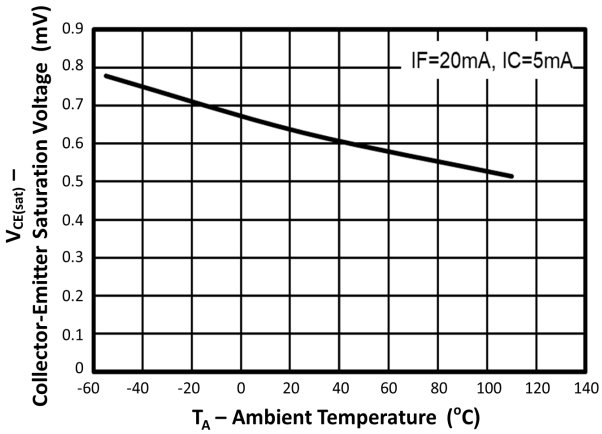


Fig 5 Collector-Emitter Saturation Voltage vs Ambient Temperature

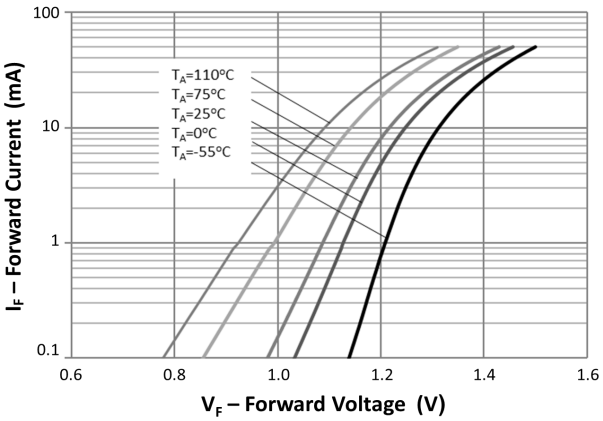


Fig 6 Forward Current vs Forward Voltage

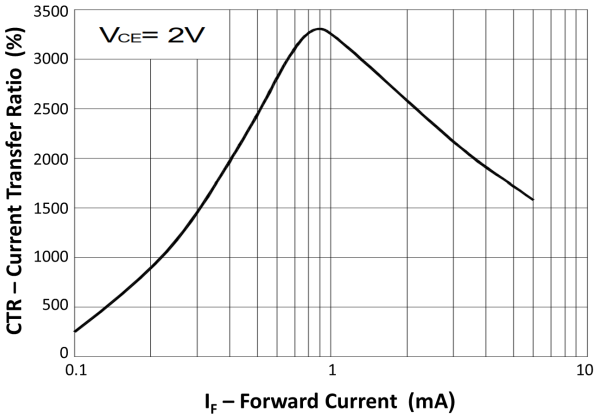


Fig 7 Current Transfer Ratio vs Forward Current

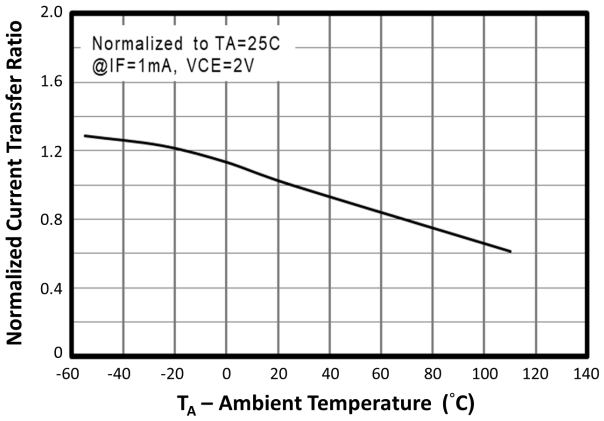


Fig 8 Normalized Current Transfer Ratio vs Ambient Temperature

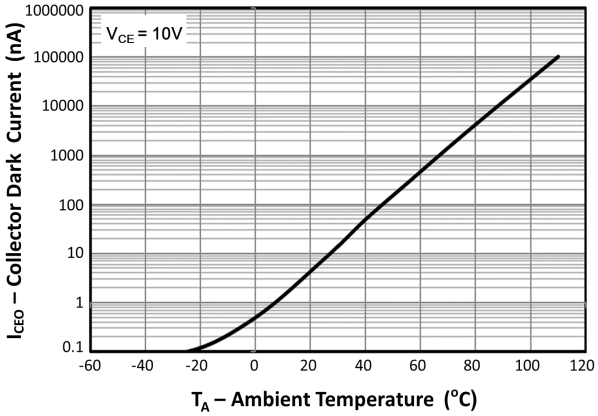


Fig 9 Collector Dark Current vs Ambient Temperature

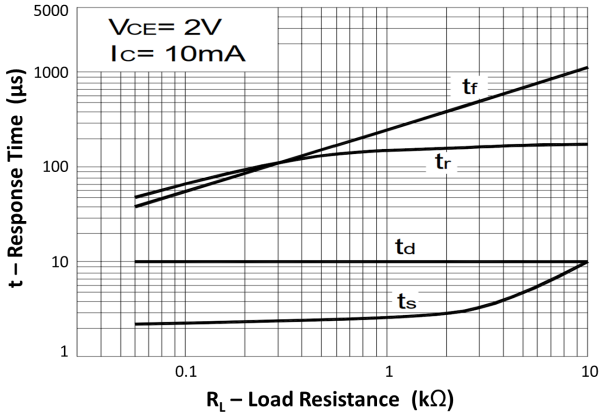


Fig 10 Response Time vs Load Resistance

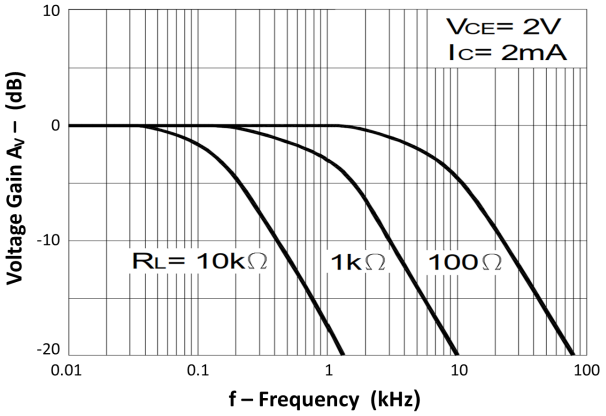
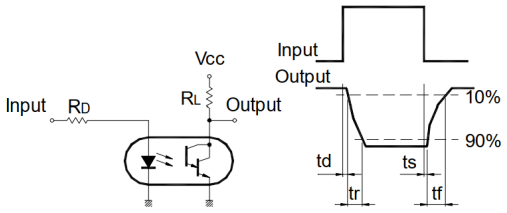
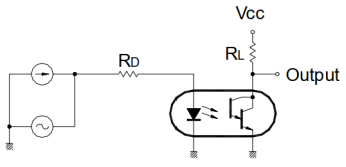


Fig 11 Frequency Response



Response Time Test Circuit



Frequency Response Test Circuit

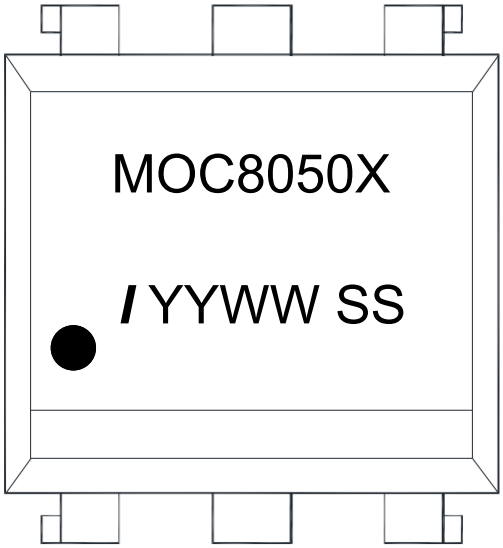
ORDER INFORMATION

MOC8030, MOC8050 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	MOC8030, MOC8050	Standard DIP6	65 pcs per tube
G	MOC8030G, MOC8050G	10mm Lead Spacing	65 pcs per tube
SM	MOC8030SM, MOC8050SM	Surface Mount	65 pcs per tube
SMT&R	MOC8030SMT&R MOC8050SMT&R	Surface Mount Tape and Reel	1000 pcs per reel

MOC8030X, MOC8050X (UL and VDE Approvals)			
After PN	**PN**	**Description**	**Packing quantity**
None	MOC8030X, MOC8050X	Standard DIP6	65 pcs per tube
G	MOC8030XG, MOC8050XG	10mm Lead Spacing	65 pcs per tube
SM	MOC8030XSM, MOC8050XSM	Surface Mount	65 pcs per tube
SMT&R	MOC8030XSMT&R MOC8050XSMT&R	Surface Mount Tape and Reel	1000 pcs per reel

DEVICE MARKING

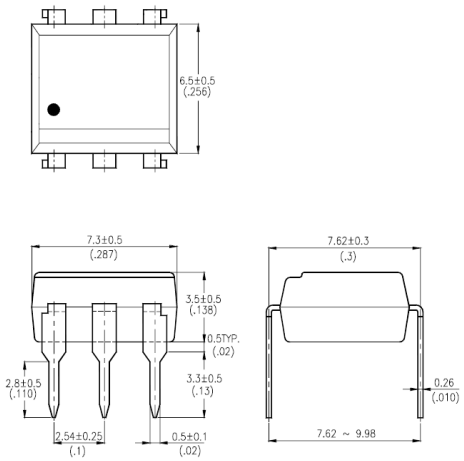
Example : MOC8050X



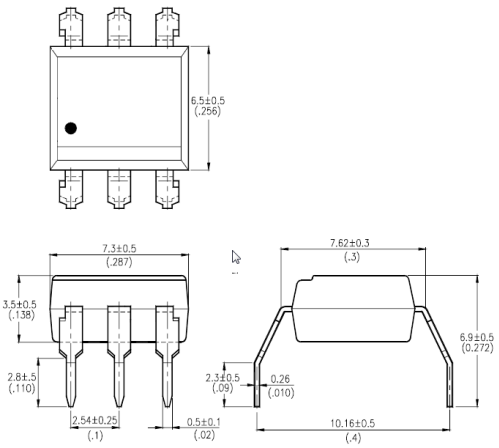
MOC8050X	Device Part Number
I	Isocom
YY	2 digit Year code
WW	2 digit Week code
SS	UL Model

PACKAGE DIMENSIONS in mm (inch)

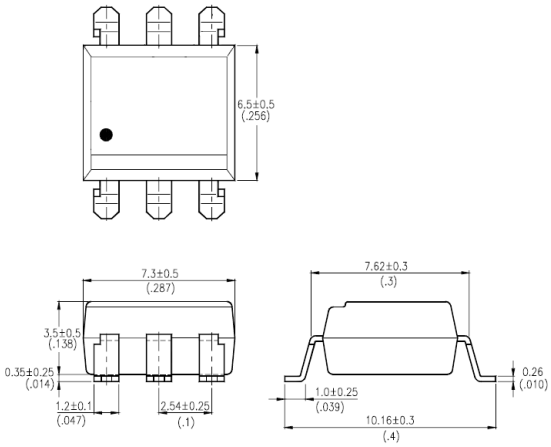
DIP



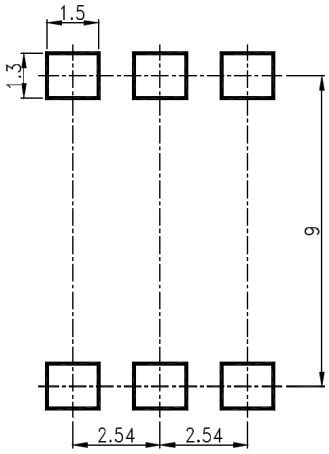
G Form



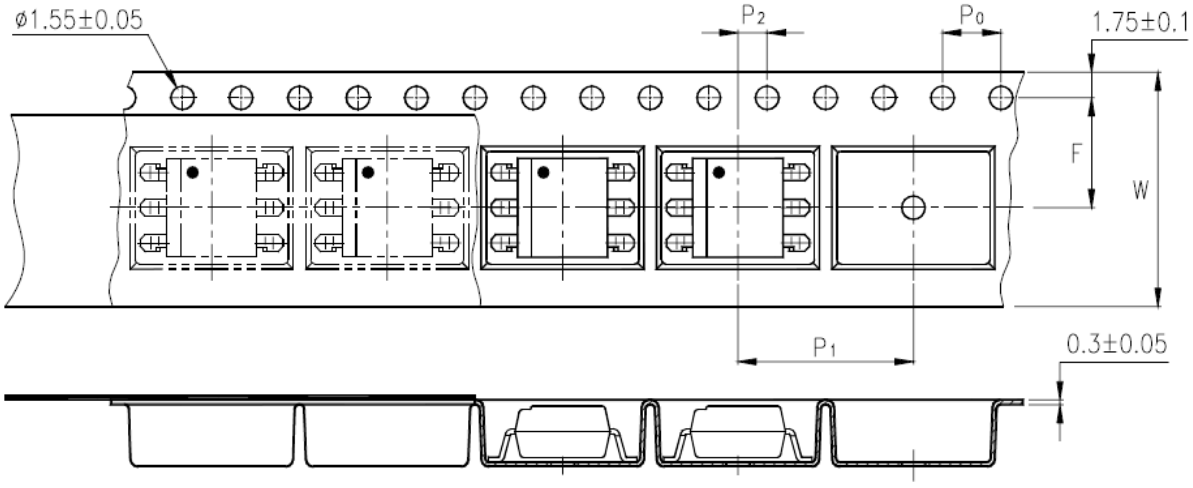
Surface Mount



RECOMMENDED SOLDER PAD LAYOUT (mm)



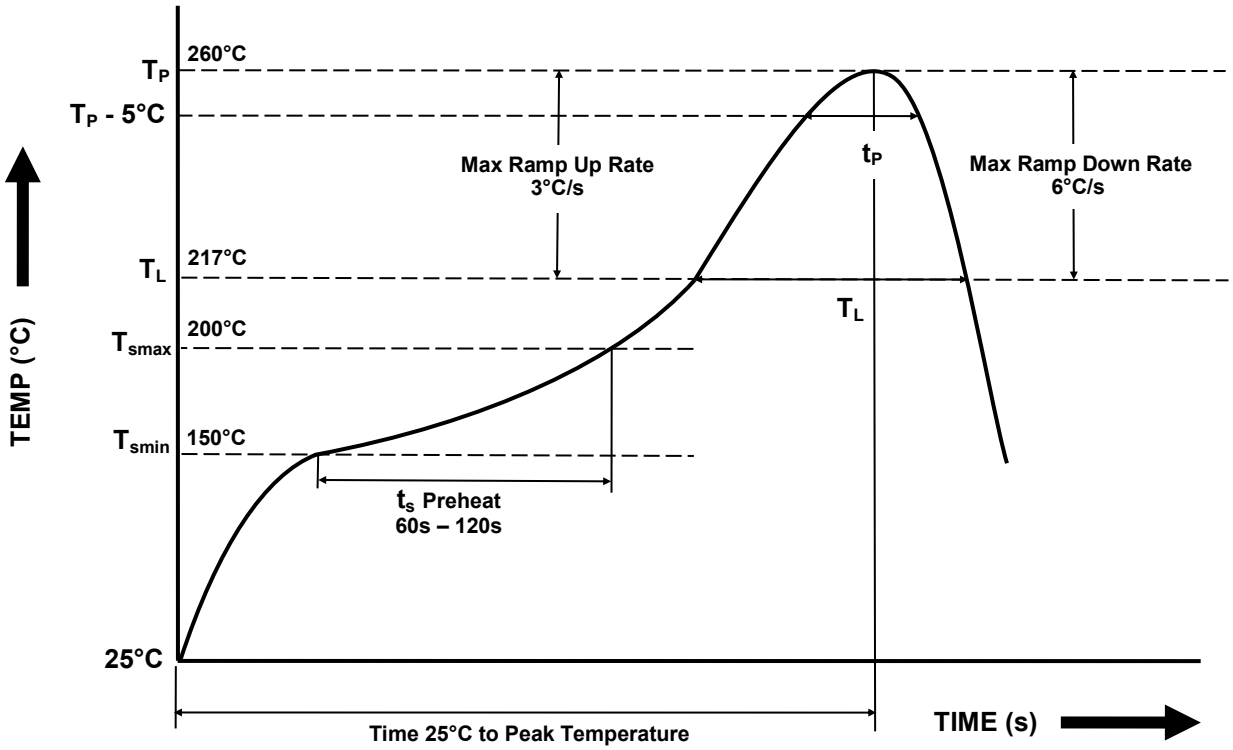
TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	12 ± 0.1 (0.472)

IR REFLOW SOLDERING TEMPERATURE PROFILE

One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



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) - Time at Peak Temperature - 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 10s max 217°C 30s max 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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