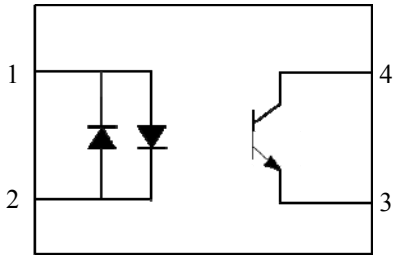
IS180

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_{RMS}
- 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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ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

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

OUTPUT

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

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	I_F = ±1mA, V_{CE} = 5V Optional CTR Grades A	20 50		400 150	%
Collector—Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = ±20mA, I_C = 1mA			0.2	V
Input to Output Isolation Voltage	V_{ISO}	Note 1	3750			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	V_{IO}= 500V Note 1	$5x10^{10}$			Ω
Floating Capacitance	C_f	V = 0V, f = 1MHz		0.5	1	pF
Output Rise Time	t_r	V_{CE} = 2V, Ic = 2mA, R_L = 100Ω		4	18	µs
Output Fall Time	t_f			3	18	µs

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

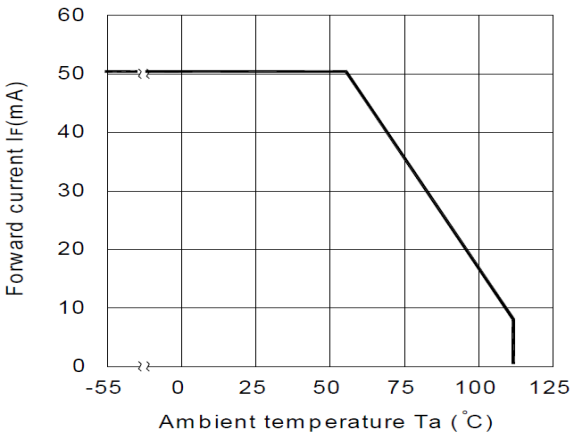


Fig 1 Forward Current vs T_A

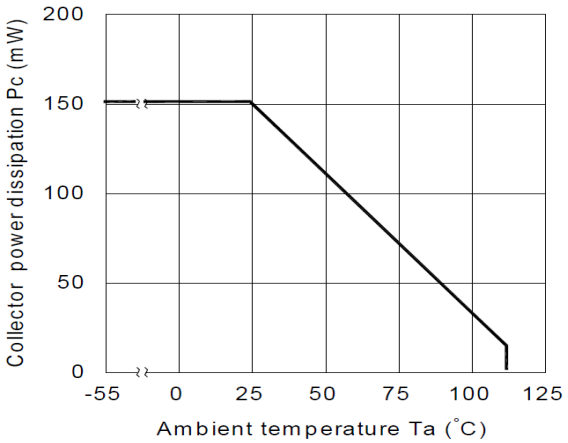


Fig 2 Collector Power Dissipation vs T_A

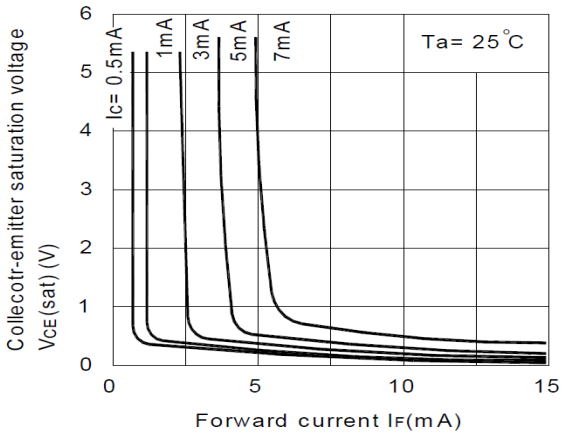


Fig 3 Collector-emitter Saturation Voltage vs Forward Current

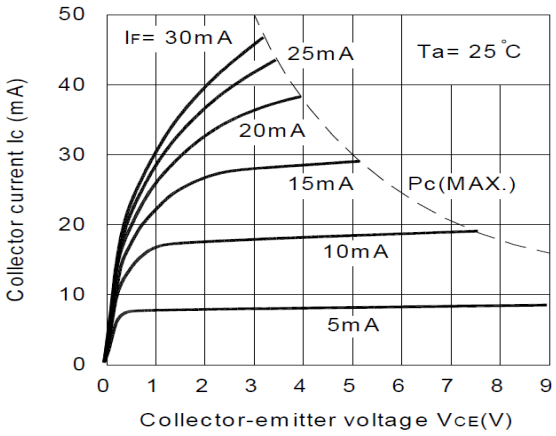


Fig 4 Collector Current vs Collector-emitter Voltage

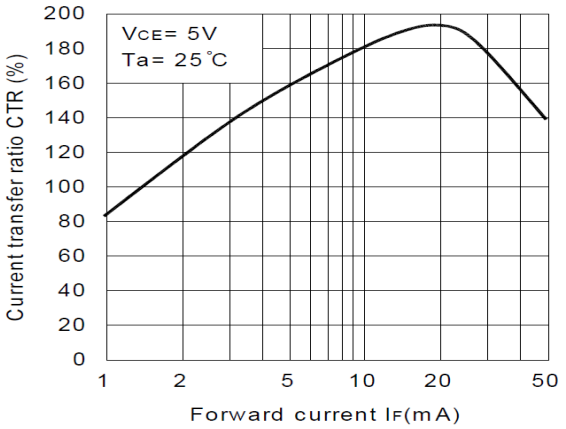


Fig 5 Current Transfer Ratio vs Forward Current

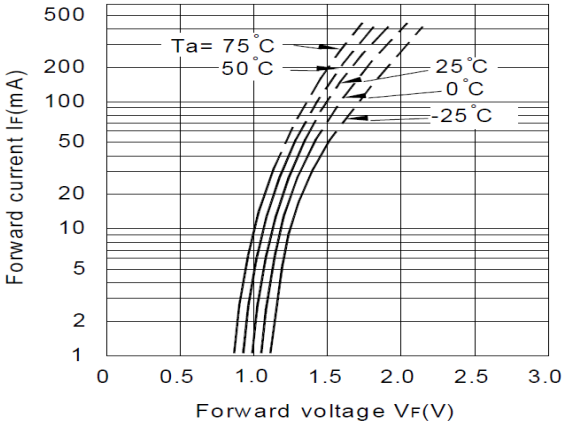


Fig 6 Forward Current vs Forward Voltage

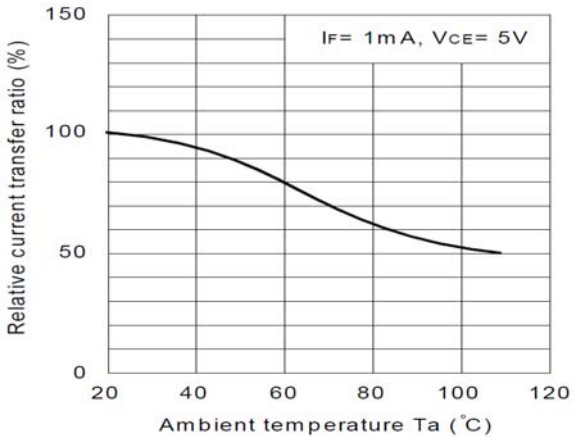


Fig 7 Relative CTR vs T_A

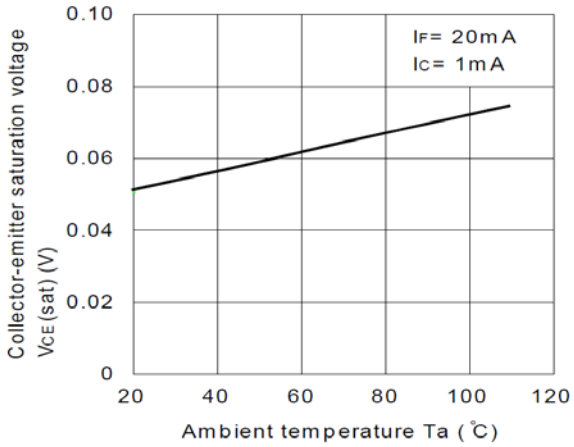


Fig 8 Collector-emitter Saturation Voltage vs T_A

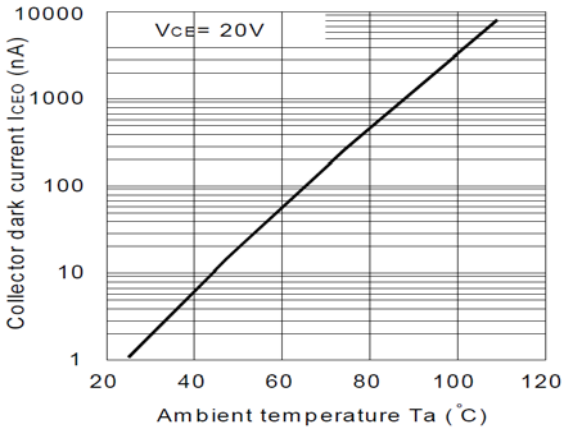


Fig 9 Collector Dark Current vs T_A

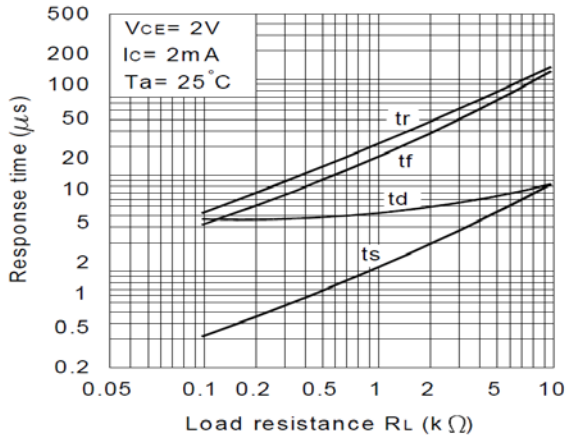


Fig 10 Response Time vs Load Resistance

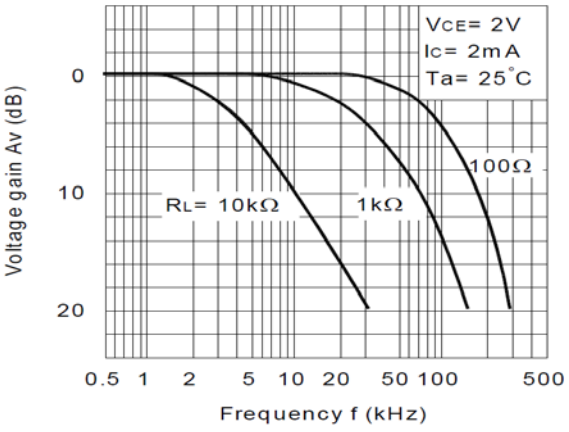
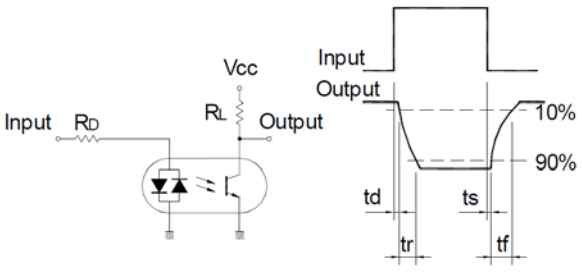


Fig 11 Frequency Response

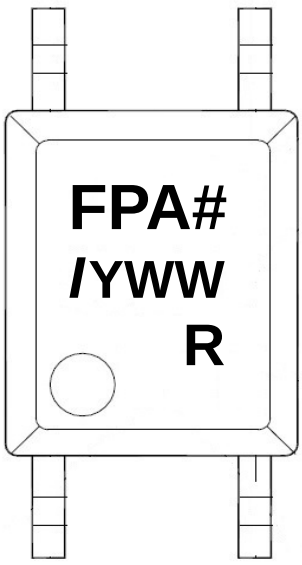


Response Time Test Circuit

STANDARD PACKING QUANTITY

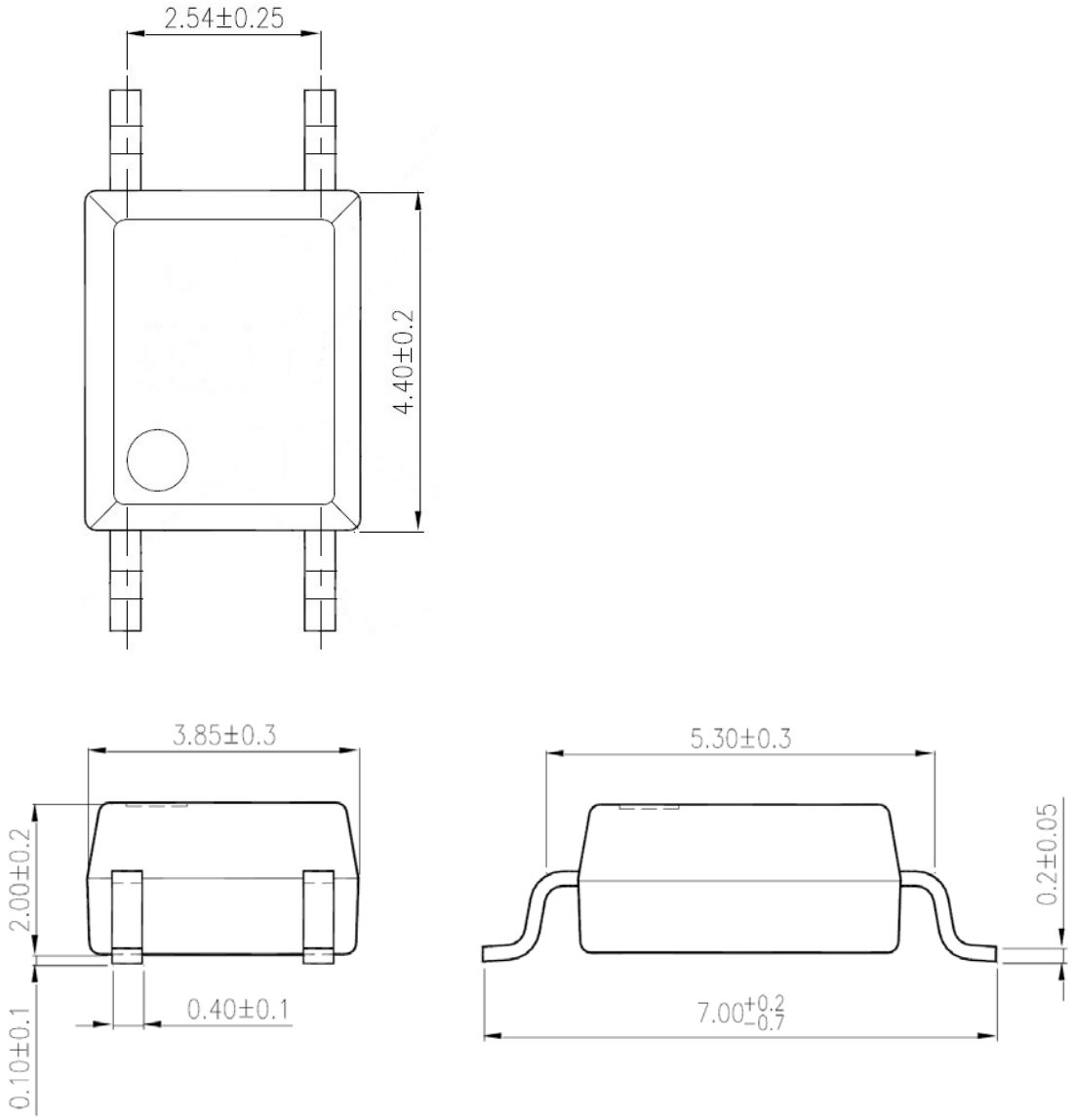
IS180			
After PN	**PN**	**Description**	**Packing quantity**
None	IS180, IS180A	Surface Mount Tape & Reel	3000 pcs per reel

DEVICE MARKING

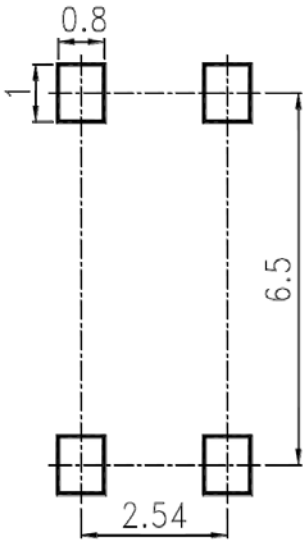


FPA#	denotes Device Part Number where "#" is internal control number
/	denotes Isocom
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
R	denotes CTR Grade

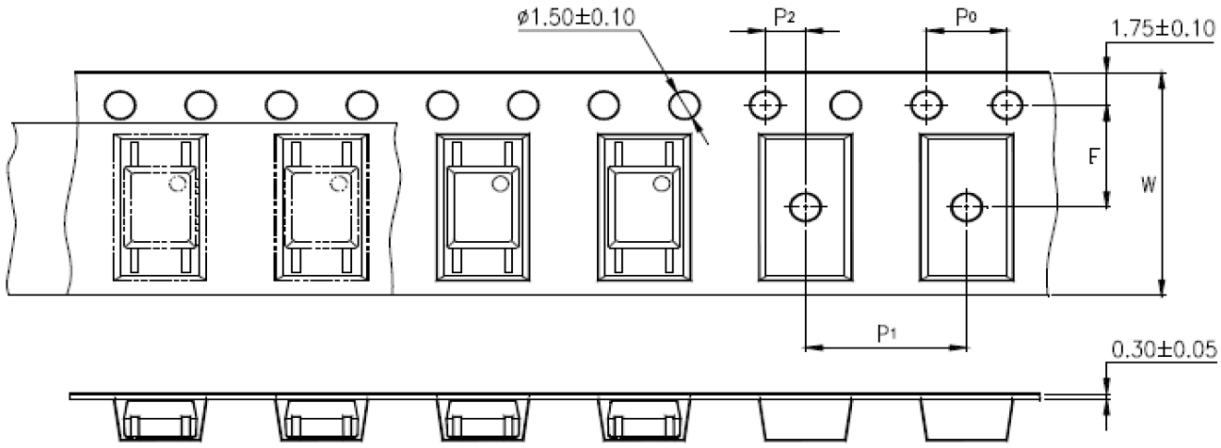
PACKAGE DIMENSIONS (mm)



RECOMMENDED SOLDER PAD LAYOUT (mm)

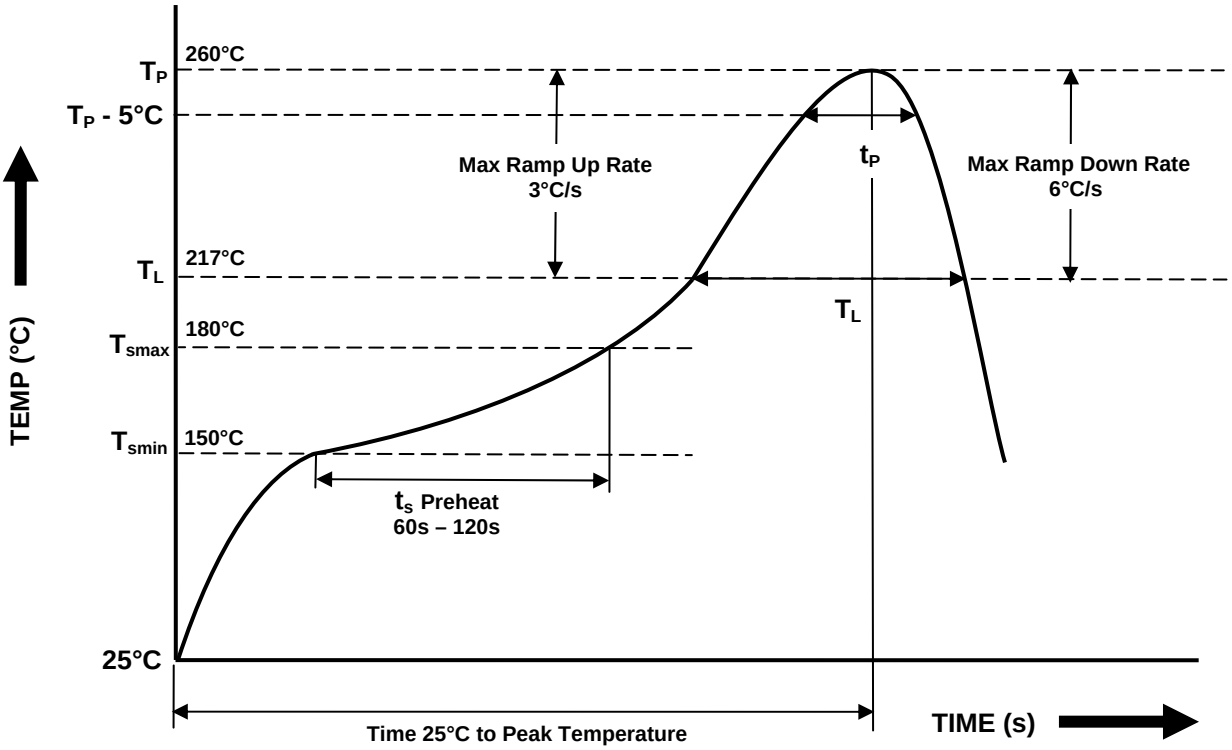


TAPE AND REEL PACKAGING



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

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



Profile Details	Conditions
Preheat	
- Min Temperature (T_{SMIN})	150°C
- Max Temperature (T_{SMAX})	180°C
- Time T_{SMIN} to T_{SMAX} (t_s)	60s - 120s
Soldering Zone	
- Peak Temperature (T_P)	260°C
- Liquidous Temperature (T_L)	217°C
- Time within 5°C of Actual Peak Temperature (T_P – 5°C)	20s
- Time maintained above T_L (t_L)	60s
- Ramp Up Rate (T_L to T_P)	3°C/s max
- Ramp Down Rate (T_P to T_L)	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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- Do not immerse device body in solder paste.

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