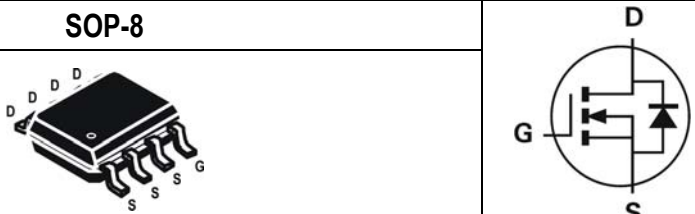
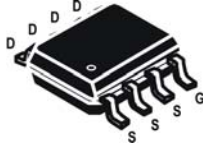


V_{DSS} , 100V R_{DS(ON)} , 26mΩ (max.) @ V_{GS}=10V R_{DS(ON)} , 31mΩ (max.) @ V_{GS}=4.5V I_D , 9.8A	SOP-8	
		

Description	Features
The SG100N03S uses advanced Trench technology and designs to provide excellent R _{DS(ON)} with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.	<ul style="list-style-type: none"> • Low On-Resistance • Low Input Capacitance • Low Miller Charge • Low Input/Output Leakage • Pb-free lead plating; RoHS compliant
	Applications
	<ul style="list-style-type: none"> • Motor / Body Load Control • Automotive Systems • Load Switch • DC-DC converters and Off-line UPS

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
SG100N07S	Halogen-Free	SOP-8	S	Tape & Reel	3,000

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	100	V
Gate-Source Voltage		V _{GS}	±20	V
Drain Current-Continuous	T _A =25°C	I _D	8.3	A
	T _A =75°C		6.4	A
Drain Current-Pulsed ^{Note 1}		I _{DM}	34	A
Avalanche Current, L=0.1mH		I _{AS}	15	A
Avalanche Energy, L=0.1mH		E _{AS}	11	mJ
Maximum Power Dissipation	T _A =25°C	P _D	2.9	W
	T _A =75°C		1.7	W
Storage Temperature Range		T _{STG}	-55 to +150	°C
Operating Junction Temperature Range		T _J	-55 to +150	°C

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	Steady-State	-	43.5	-	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	Steady-State	-	11.4	-	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =10A	-	-	26	mΩ
		V _{GS} =4.5V, I _{DS} =6A	-	-	31	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz	-	0.45	1	Ω

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	3210	-	pF
Output Capacitance	C _{oss}		-	97	-	
Reverse Transfer Capacitance	C _{rss}		-	55	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =50V, R _L =2.5Ω, R _{GEN} =3Ω	-	12.4	-	ns
Rise Time	t _r		-	26.8	-	
Turn-Off Delay Time	T _{d(off)}		-	35.1	-	
Fall Time	t _f		-	24	-	
Total Gate Charge at 10V	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =20A	-	59	-	nC
Gate to Source Gate Charge	Q _{gs}		-	14.8	-	
Gate to Drain "Miller" Charge	Q _{gd}		-	9.5	-	

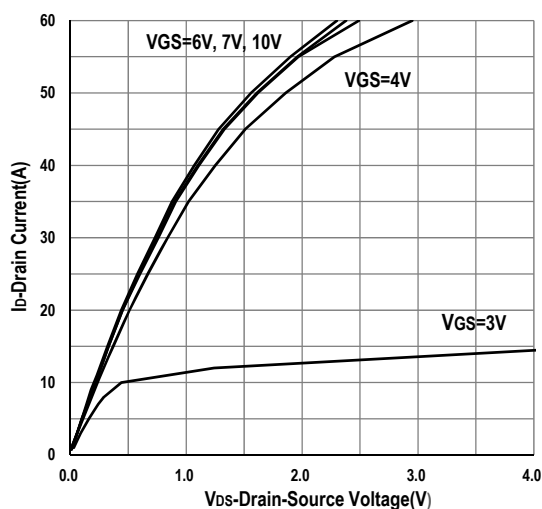
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =10A	-	-	1.3	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=100A/μs	-	23	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	27	-	nC

Notes:

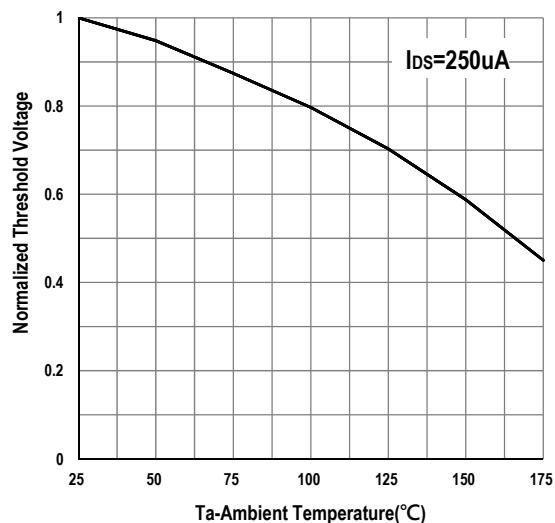
1. Pulse Test: Pulse Width ≤ 10ms, Duty Cycle ≤ 1%.
2. For surface-mounted devices, both R_{θCA} and R_{θJC} are measured with the device mounted on approximately 1"×1" FR-4 PCBs. In actual applications, many factors including the PCB material and layout, may affect the thermal resistance of the device-board assembly. For best results, characterize the thermal resistance directly in the application circuit.

Typical Operating Characteristics

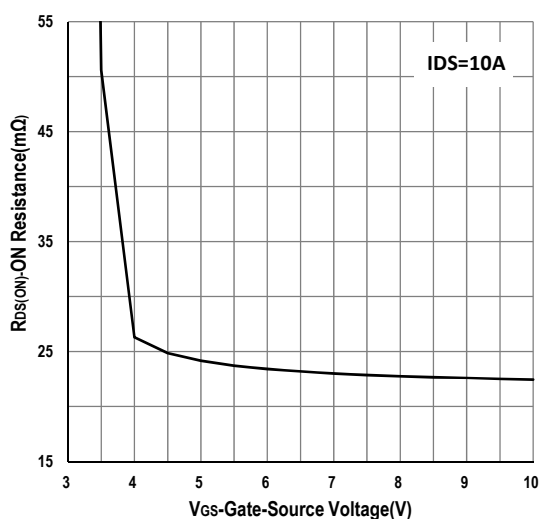
Output Characteristics



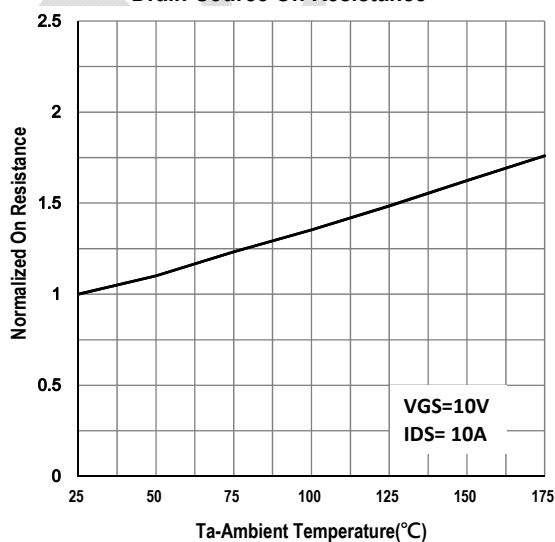
Gate Threshold Voltage



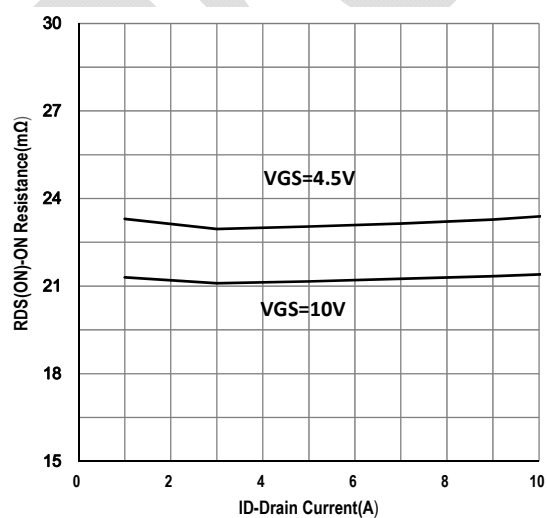
Gate-Source On Resistance



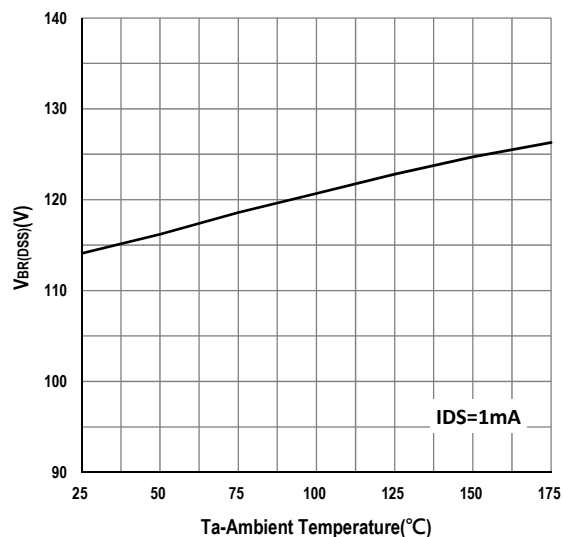
Drain-Source On Resistance



Drain-Source On Resistance

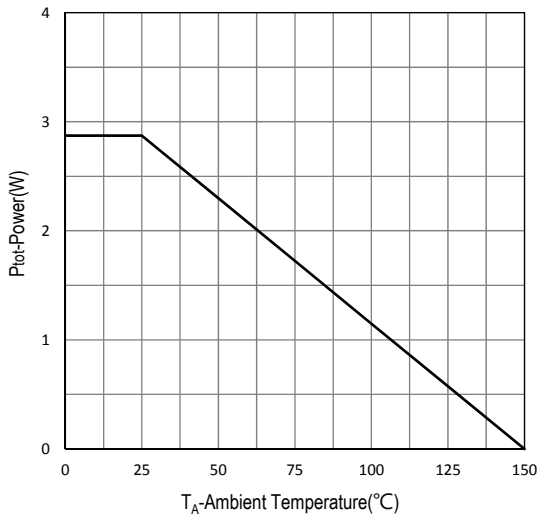


Drain-Source Breakdown Voltage

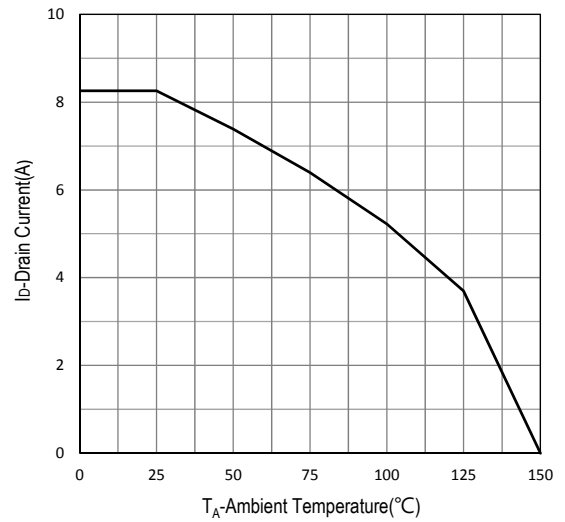


Typical Operating Characteristics (Cont.)

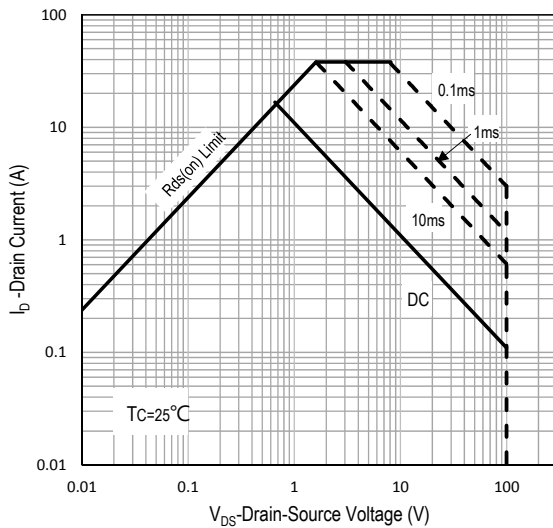
Power Dissipation



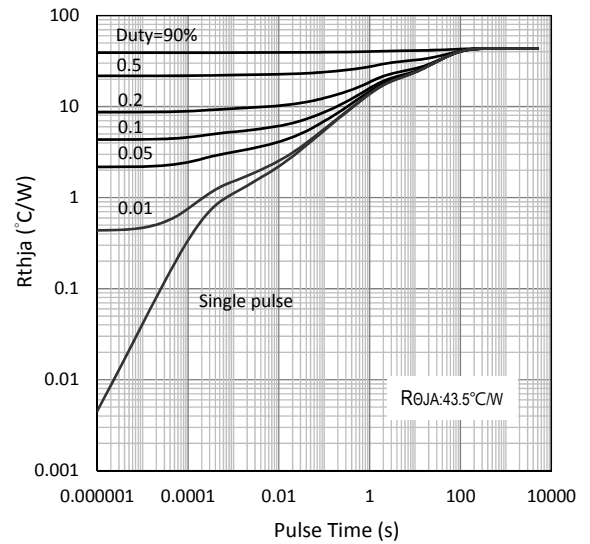
Drain Current



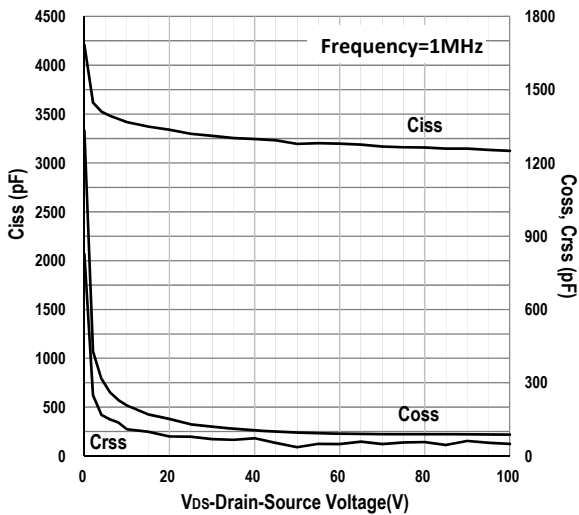
Safe Operation Area



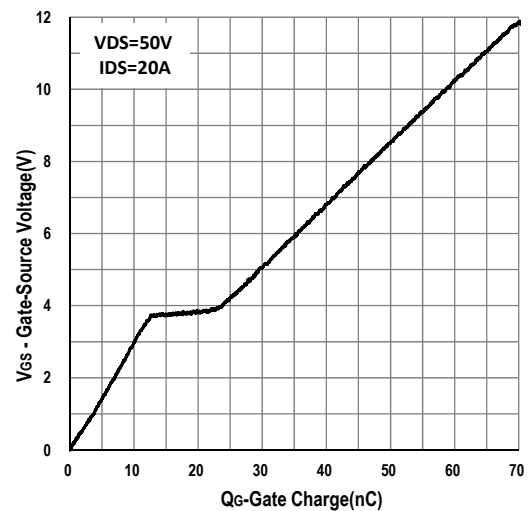
Thermal Transient Impedance



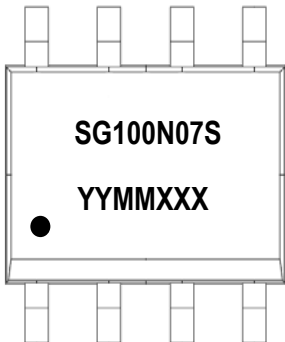
Capacitance



Gate Charge

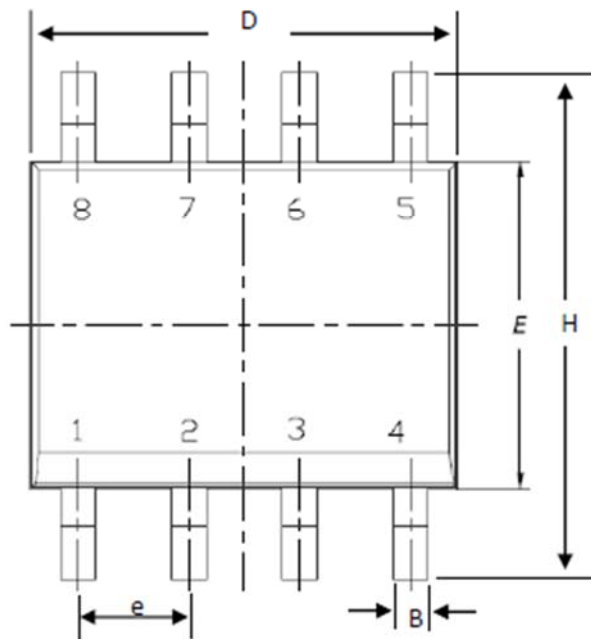


Marking Information

SOP-8	Marking Rule
<p>Laser Marking</p> 	<p><u>Line 1</u> : Device Name SG100N07S</p> <p><u>Line 2</u> : Date Code YYMMXXX</p> <p>YY : Year Code MM : Month Code XXX : Serial Number</p>

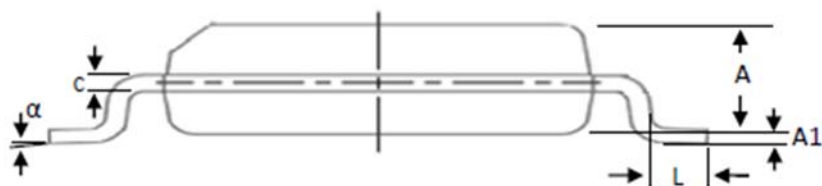
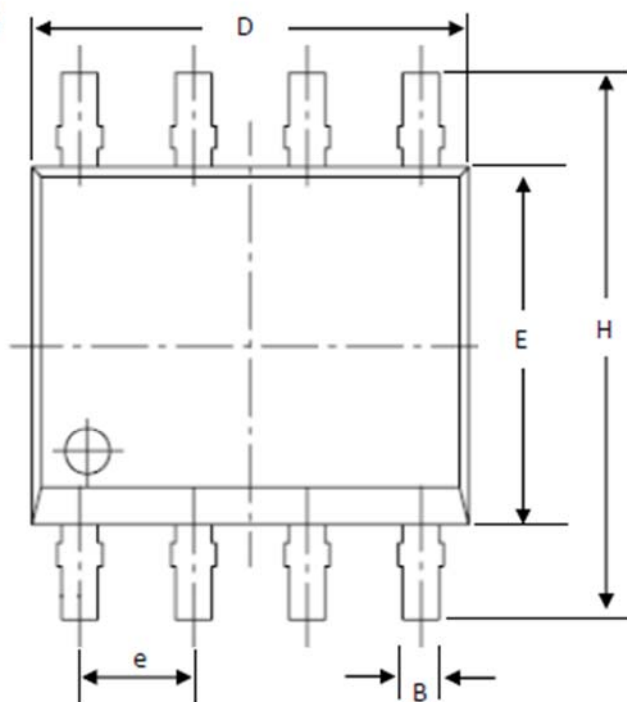
Package of Dimension

G-TYPE



Symbol	Min	Nor	Max
A	1.35	1.55	1.75
A1	0.10	0.18	0.25
B	0.31	0.41	0.51
c	0.17	0.21	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27	1.27	1.27
H	5.80	6.00	6.20
L	0.40	0.84	1.27
α	0.00	4.00	8.00

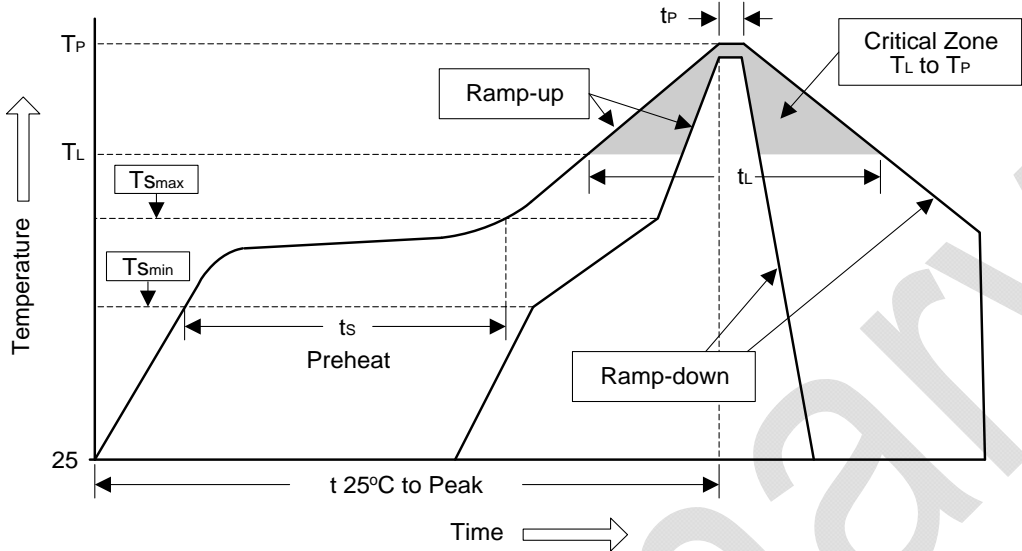
B-TYPE



Soldering Methods for Silicongear's Products

- Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
- Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat <ul style="list-style-type: none"> - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (min to max) (t_s) 	100°C 150°C 60 to 120 sec	150°C 200°C 60 to 180 sec
T_{Smax} to T_L <ul style="list-style-type: none"> - Ramp-up Rate 	<3°C/sec	<3°C/sec
Time maintained above: <ul style="list-style-type: none"> - Temperature (T_L) - Time (t_L) 	183°C 60 to 150 sec	217°C 60 to 150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec

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