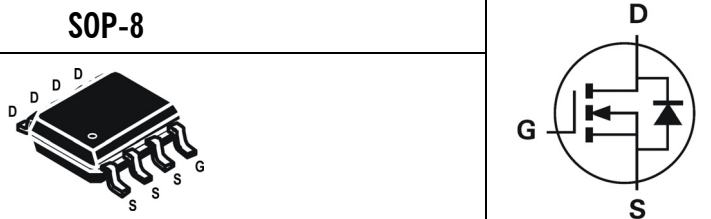
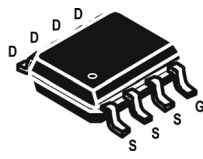


V_{DSS} , 100V R_{DS(ON)} , 23mΩ (max.) @ V_{GS}=10V R_{DS(ON)} , 28.5mΩ (max.) @ V_{GS}=4.5V I_D , 9.8A	SOP-8	
		

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
	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
SG100N03S	Halogen-Free	SOP-8	S	Tape & Reel	2,500

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	9.8	A
	T _A =70°C		7.9	A
Drain Current-Pulsed ^{Note 1}		I _{DM}	35	A
Avalanche Current, L=3mH		I _{AS}	6.5	A
Avalanche Energy, L=3mH		E _{AS}	63	mJ
Maximum Power Dissipation	T _A =25°C	P _D	3.1	W
	T _A =70°C		2	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
Maximum Junction-to-Ambient	R _{θJA}	t ≤ 10s	-	-	40	°C/W
Maximum Junction-to-Case	R _{θJC}	Steady State	-	-	25	°C/W

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

OFF CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_{DS} = 250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA

ON CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_{DS} = 250\mu A$	1.2	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_{DS} = 10A$	-	18	23	m Ω
		$V_{GS} = 4.5V, I_{DS} = 8A$	-	22	28.5	

DYNAMIC CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$	-	1325	-	pF
Output Capacitance	C_{oss}		-	110	-	
Reverse Transfer Capacitance	C_{rss}		-	64	-	

SWITCHING CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	$T_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, R_L = 5\Omega, R_{GEN} = 3\Omega$	-	7	-	ns
Rise Time	t_r		-	7	-	
Turn-Off Delay Time	$T_{d(off)}$		-	29	-	
Fall Time	t_f		-	7	-	
Total Gate Charge at 10V	Q_g	$V_{GS} = 10V, V_{DS} = 50V, I_D = 10A$	-	34	-	nC
Gate to Source Gate Charge	Q_{gs}		-	6	-	
Gate to Drain "Miller" Charge	Q_{gd}		-	9	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

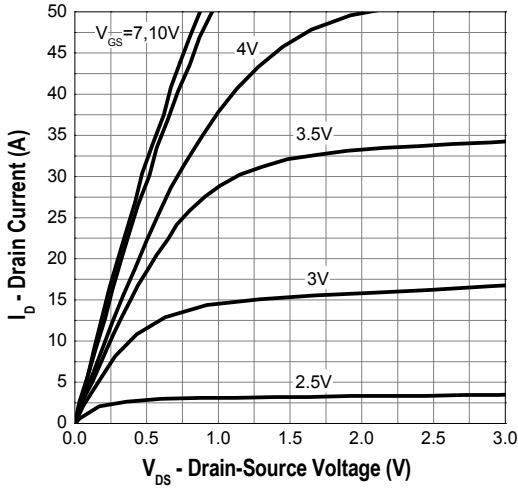
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 10A$	-	-	1.3	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10A, di/dt = 500A/\mu s$	-	32	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	200	-	nC

Notes:

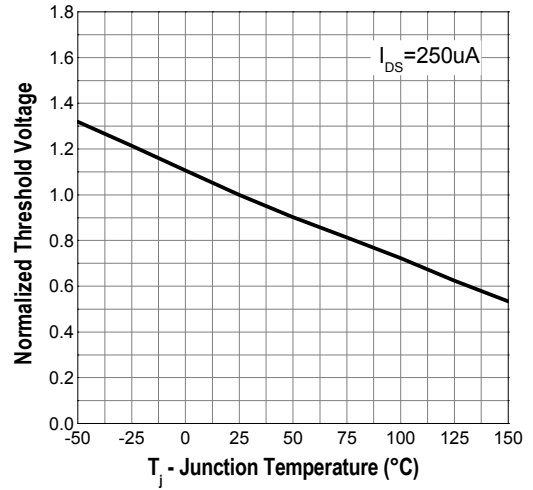
1. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

Typical Operating Characteristics

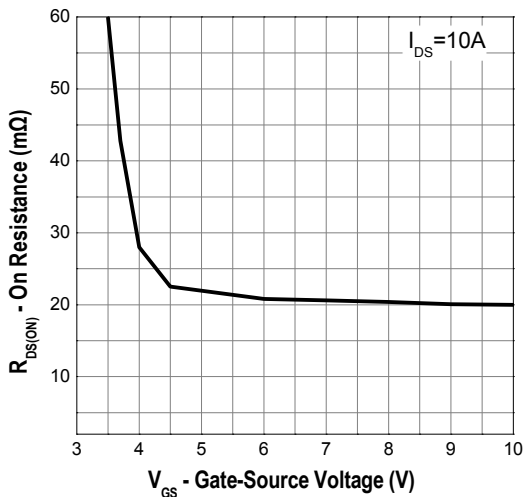
Output Characteristics



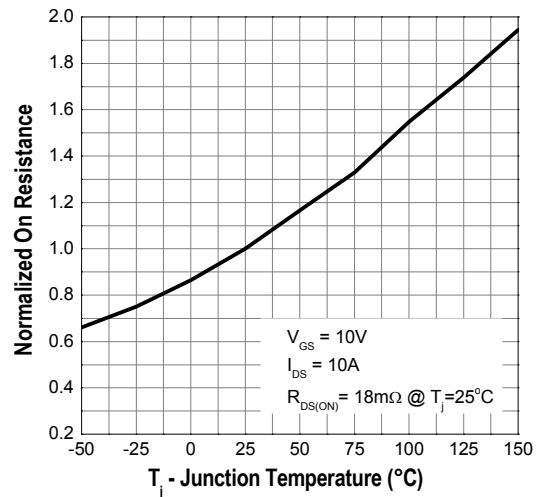
Gate Threshold Voltage



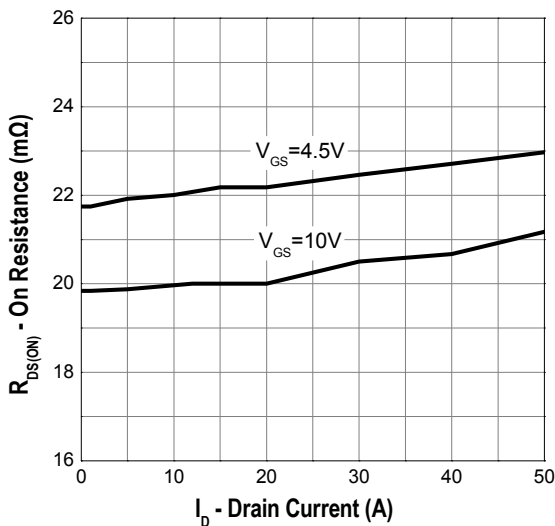
Gate-Source On Resistance



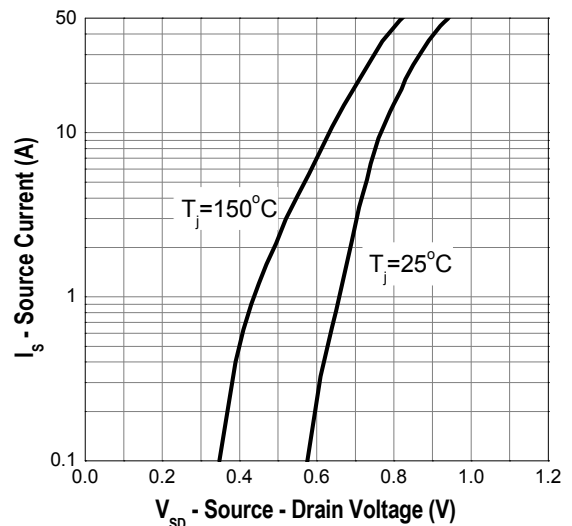
Drain-Source On Resistance



Drain-Source On Resistance

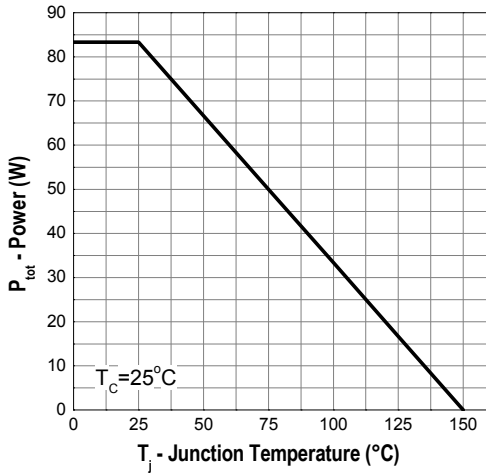


Source-Drain Diode Forward

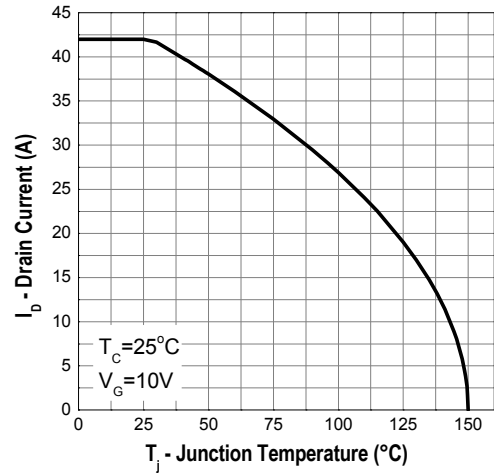


Typical Operating Characteristics (Cont.)

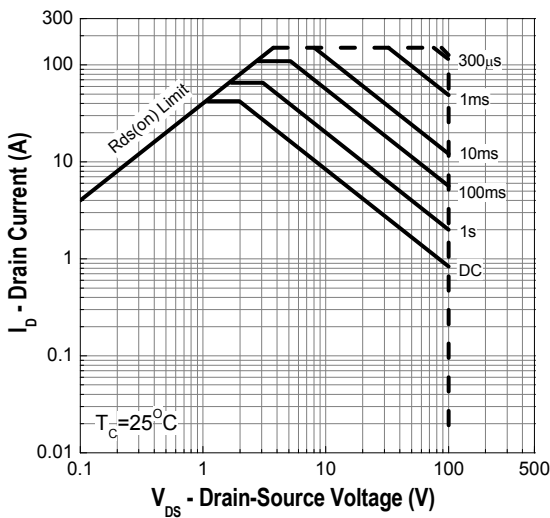
Power Dissipation



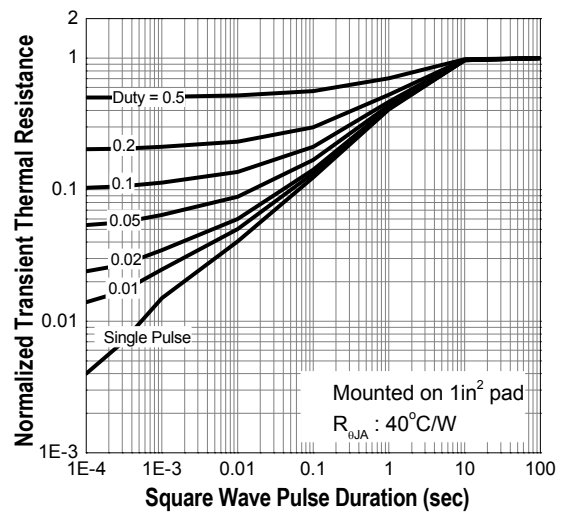
Drain Current



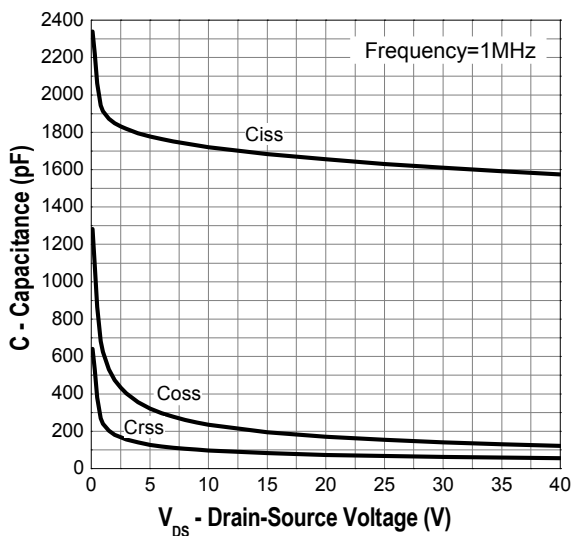
Safe Operation Area



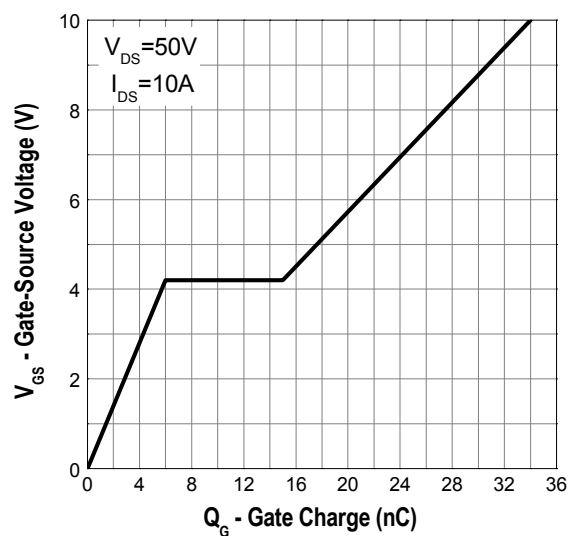
Thermal Transient Impedance



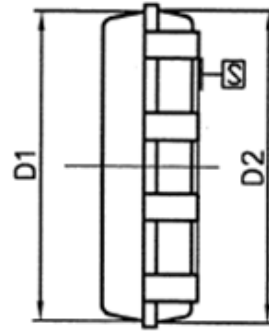
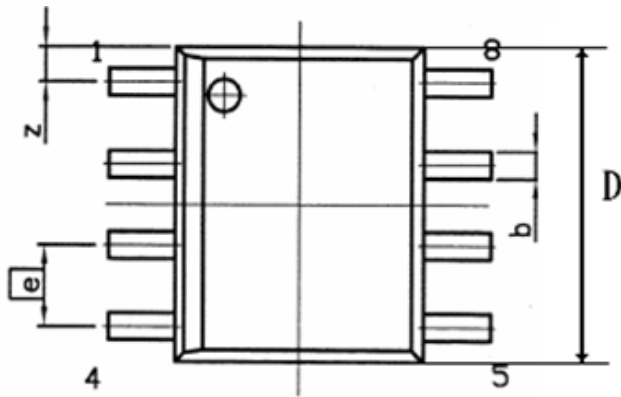
Capacitance



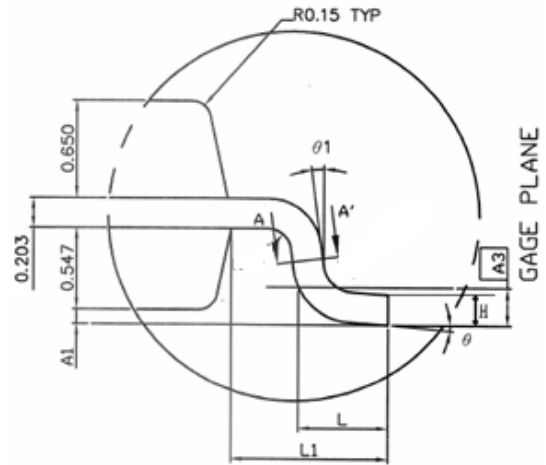
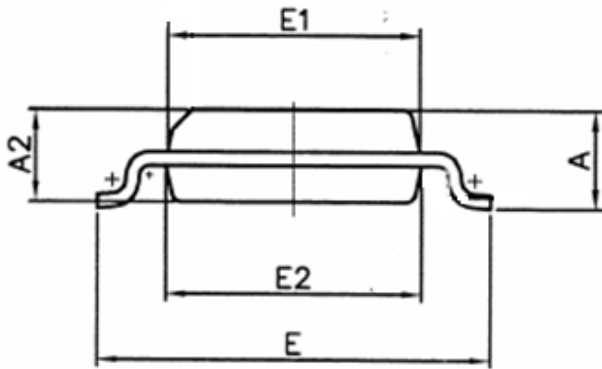
Gate Charge



SOP-8 Dimensions



DETAIL A

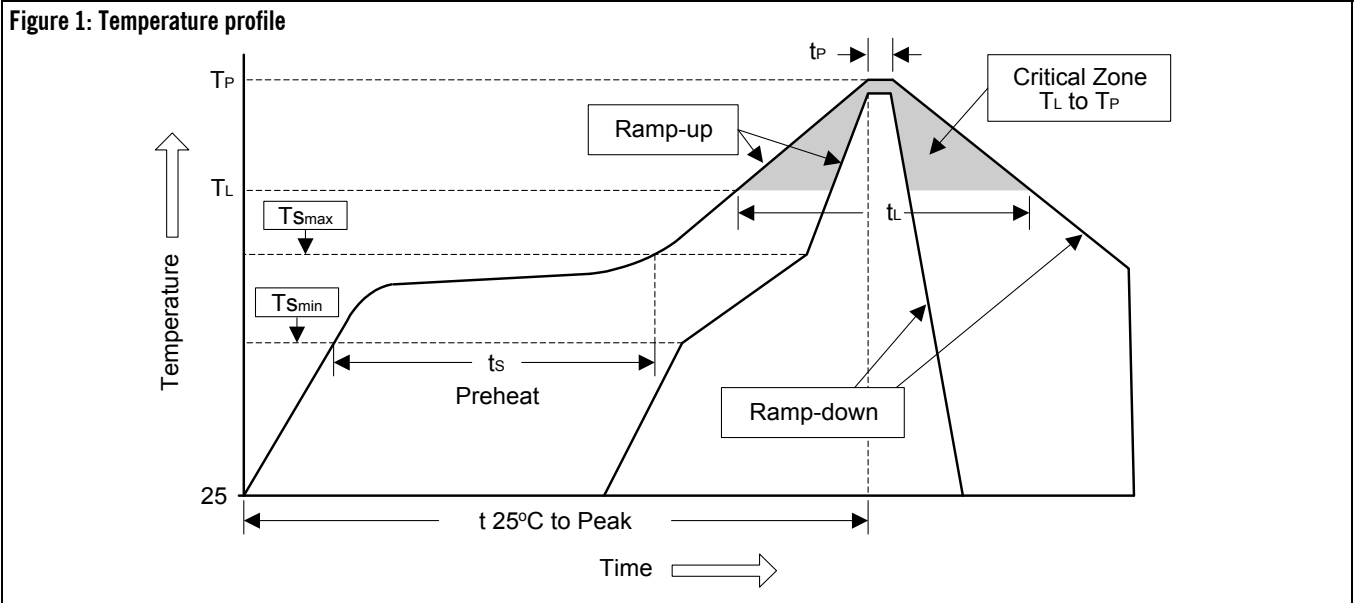


SOP-8 Dimensions

Symbols	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35	1.55	1.753	0.053	0.061	0.069
A1	0.10	0.15	0.25	0.004	0.006	0.010
A2	1.27	1.52	1.626	0.050	0.060	0.064
A3	-	0.254	-	-	0.010	-
b	0.30	0.40	0.51	0.012	0.016	0.020
D	4.70	4.90	5.10	0.185	0.193	0.201
D1	4.70	4.90	5.00	0.185	0.193	0.197
D2	4.80	4.90	5.00	0.189	0.193	0.197
E	5.79	6.00	6.20	0.228	0.236	0.244
E1	3.75	3.90	4.00	0.148	0.154	0.157
E2	3.75	3.90	4.00	0.148	0.154	0.157
H	0.17	0.21	0.25	0.007	0.008	0.010
e	-	1.27	-	-	0.050	-
L	0.40	0.76	1.27	0.016	0.030	0.050
L1	0.95	1.05	1.15	0.037	0.041	0.045
θ	0°	4°	8°	0°	4°	8°
θ1	0°	-	-	0°	-	-

Soldering Methods for Silicongear's Products

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



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		
- Temperature Min (T_{smin})	100°C	150°C
- Temperature Max (T_{smax})	150°C	200°C
- Time (min to max) (t_s)	60 to 120 sec	60 to 180 sec
T_{smax} to T_L		
- Ramp-up Rate	< 3°C/sec	< 3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60 to 150 sec	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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