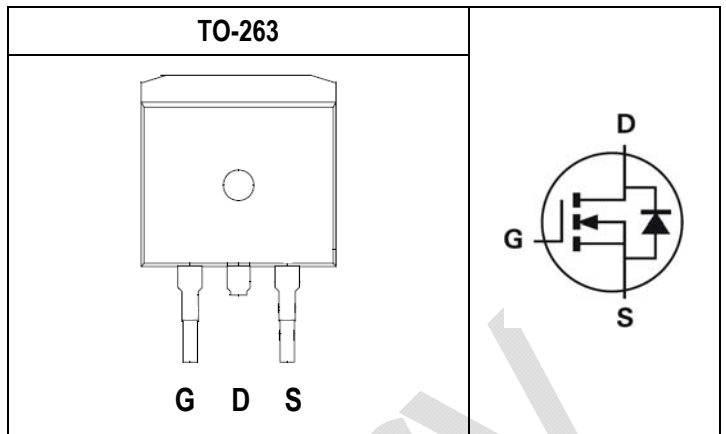


Key Performance Parameters		
Parameter	Value	Unit
V_{DSS}	100	V
$R_{DS(ON) \max.} V_{GS}=10V$	5.4	m Ω
$R_{DS(ON) \max.} V_{GS}=4.5V$	7.7	m Ω
I_D	74	A
Q_g	74.7	nC
Q_{gd}	18.9	nC
Q_{SW}	27.2	nC



Features	Application
<ul style="list-style-type: none"> Optimized for synchronous rectification Low Input Capacitance Low Miller Capacitance Fully Characterized Capacitance and Avalanche Pb-free lead plating; RoHS compliant 	<ul style="list-style-type: none"> BLDC Motor drive applications Battery powered circuits Synchronous rectifier applications Resonant mode power supplies

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
DG100N15G	Halogen-Free	TO-263	G	Tape & Reel	800

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	$T_C=25^\circ\text{C}$	74
		$T_C=100^\circ\text{C}$	47
Drain Current-Pulsed ^{Note 1}	I_{DM}	145	A
Avalanche Current	I_{AR}	14	A
Single Pulse Avalanche Energy ^{Note 3}	E_{AS}	9.8	mJ
Maximum Power Dissipation	P_{tot}	45	W
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient ^{Note 2}	$R_{\theta JA}$	Steady State	-	43.4	-	$^\circ\text{C/W}$
Thermal resistance, Junction-to-Case	$R_{\theta JC}$	Steady State	-	2.76	-	$^\circ\text{C/W}$

Notes:

- Pulse Test: Pulse Width $\leq 10\text{ms}$, Duty Cycle $\leq 1\%$.
- $R_{\theta JA}$ 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.
- Starting $T_J=25^\circ\text{C}$, $L=0.1\text{mH}$, $R_g=50\Omega$, $V_{GS}=10\text{V}$, Rated $V_{DS}=100\text{V}$ N-CH.

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

STATIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_{DS}=1mA$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$	-	-	10	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$	-	-	100	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA

STATIC 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	-	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_{DS}=50A$	-	-	5.4	m Ω
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_{DS}=20A$	-	-	7.7	m Ω
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	1.0	-	Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_{DS}=20A$	-	43.0	-	S

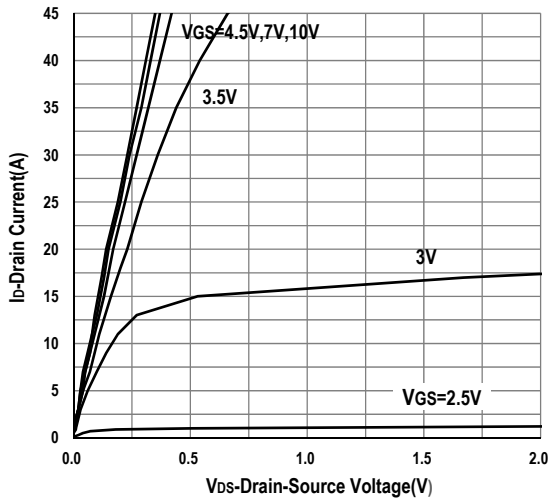
DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	-	3781	-	pF
Output Capacitance	C_{oss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	-	567	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	-	39	-	pF
Turn-On Delay Time	$T_{d(on)}$	$V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3\Omega$	-	16.1	-	ns
Rise Time	t_r	$V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3\Omega$	-	60.2	-	ns
Turn-Off Delay Time	$T_{d(off)}$	$V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3\Omega$	-	55.9	-	ns
Fall Time	t_f	$V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3\Omega$	-	100.4	-	ns

GATE CHARGE CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate to Source Gate Charge	Q_{gs}	$V_{DD}=50V, I_D=30A,$	-	15.4	-	nC
Gate charge at threshold	$Q_{g(th)}$	$V_{DD}=50V, I_D=30A,$	-	7.1	-	nC
Gate to Drain Charge	Q_{gd}	$V_{DD}=50V, I_D=30A,$	-	18.9	-	nC
Switching charge	Q_{SW}	$V_{DD}=50V, I_D=30A,$	-	27.2	-	nC
Gate charge total	Q_g	$V_{DD}=50V, I_D=30A, V_{GS}=0$ to 10V	-	74.7	-	nC
Gate plateau voltage	$V_{plateau}$	$V_{DD}=50V$	-	3.8	-	V
Gate charge total, sync. FET ($Q_g - Q_{gd}$)	$Q_{g(sync)}$	$V_{DS}=0.1V$	-	55.7	-	nC

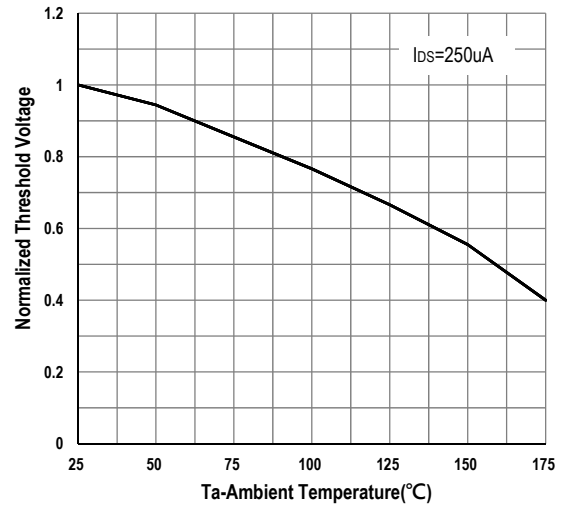
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_F=20A$	-	0.7	1.3	V
Body Diode Reverse Recovery Time	t_{rr}	$V_{DD}=50V, I_F=20A, di/dt=100A/\mu s$	-	55.4	-	ns
		$V_{DD}=50V, I_F=20A, di/dt=200A/\mu s$	-	48.5	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$V_{DD}=50V, I_F=20A, di/dt=100A/\mu s$	-	88.5	-	nC
		$V_{DD}=50V, I_F=20A, di/dt=200A/\mu s$	-	152.1	-	nC
Reverse Recovery Current	I_{RRM}	$V_{DD}=50V, I_F=20A, di/dt=100A/\mu s$	-	2.74	-	A
		$V_{DD}=50V, I_F=20A, di/dt=200A/\mu s$	-	5.42	-	A

Typical Operating Characteristics

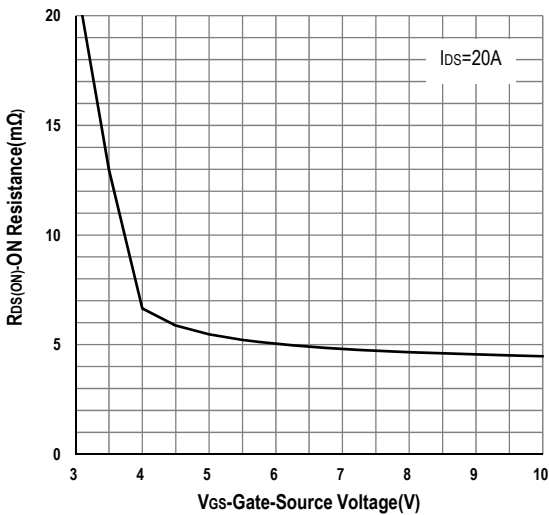
Output Characteristics



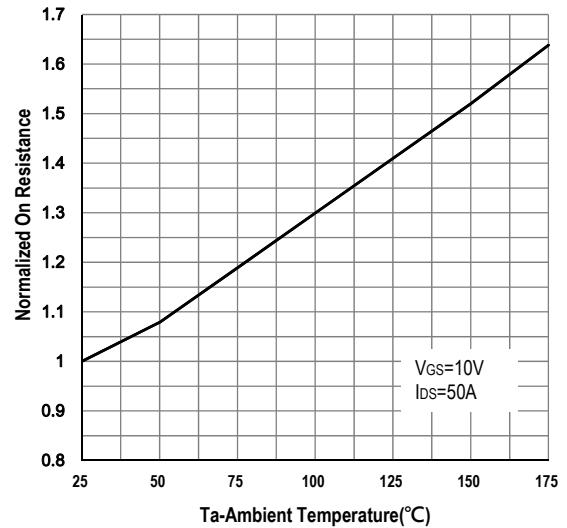
Gate Threshold Voltage



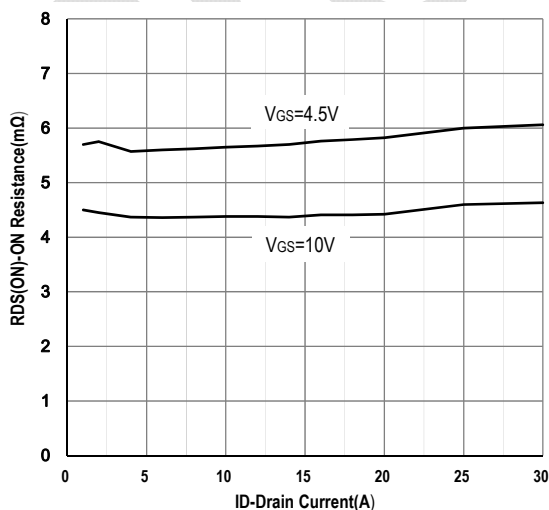
Gate-Source On Resistance



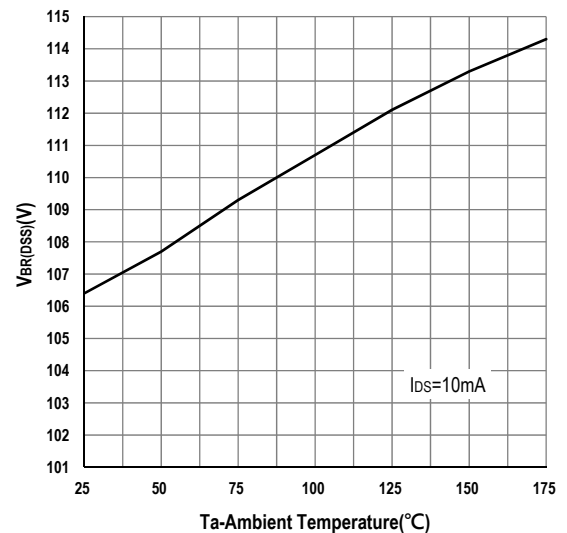
Drain-Source On Resistance



Drain-Source On Resistance

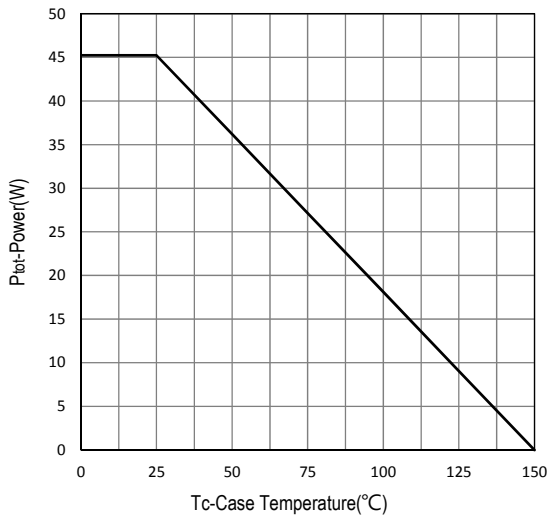


Drain-source Breakdown Voltage

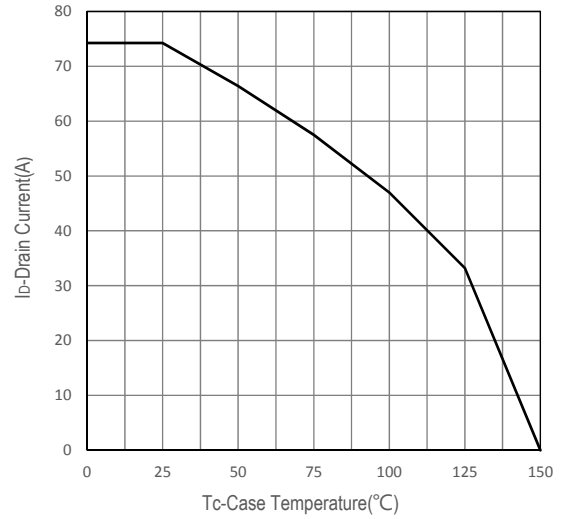


Typical Operating Characteristics (Cont.)

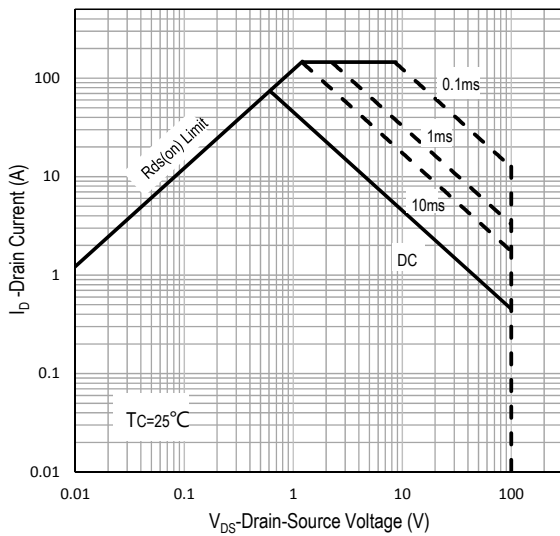
Power Dissipation



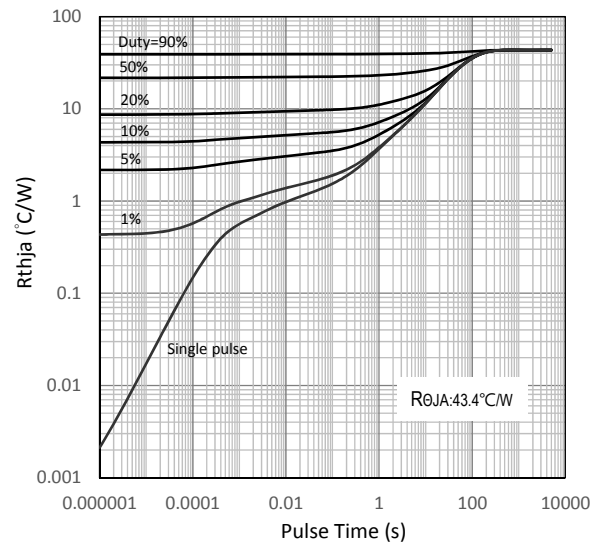
Drain Current



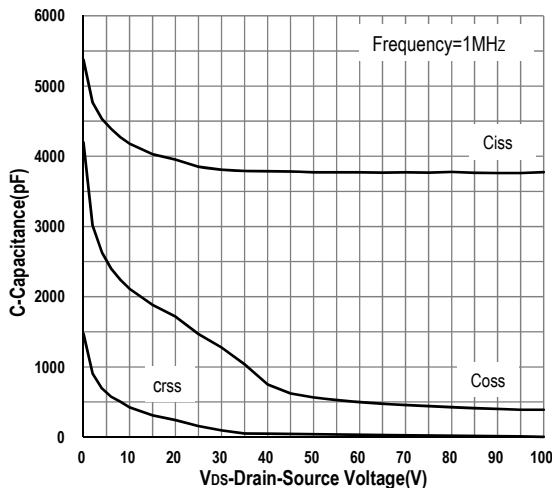
Safe Operation Area



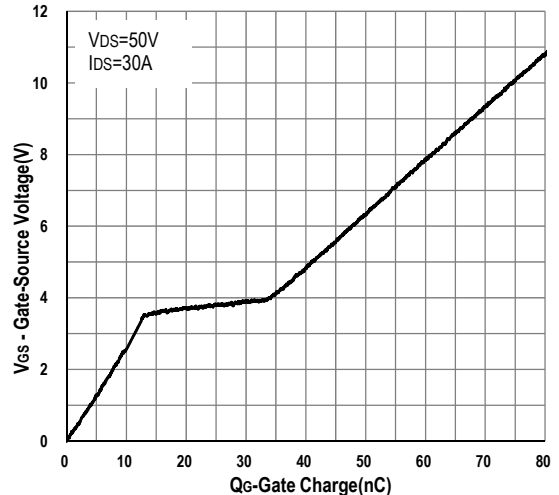
Transient Thermal Impedance



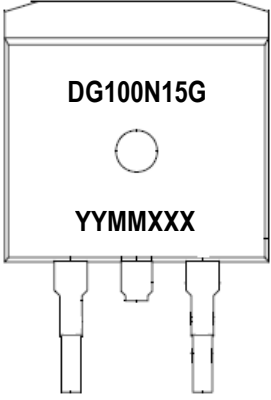
Capacitance



Gate Charge



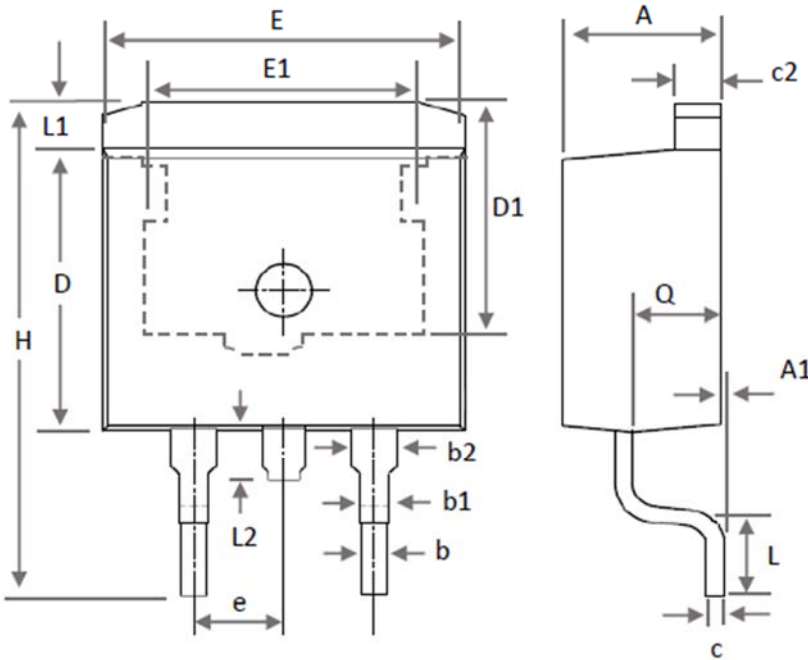
Marking Information

TO-263(G)	Marking Rule
<p>Laser Marking</p> 	<p><u>Line 1</u> : Device Name DG100N15G</p> <p><u>Line 2</u> : Date Code YYMMXXX</p> <p>YY : Year Code MM : Month XXX : Serial Number</p>

Preliminary

Package of Dimension

TO-263S

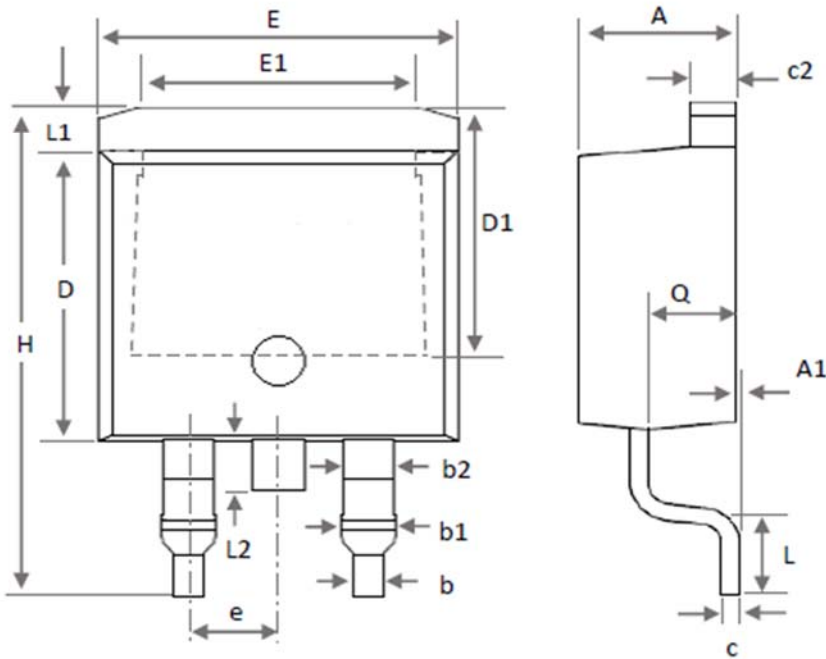


Symbol	Min	Nor	Max
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.66	0.76	0.96
b1	0.76	0.86	1.06
b2	1.14	1.27	1.47
c	0.40	0.50	0.60
c2	1.15	1.30	1.45
D	8.38	8.60	8.90
D1	6.86	7.16	-
E	9.90	10.20	10.50
E1	7.80 Ref.		
e	2.54 BSC		
H	14.61	15.00	15.88
L	1.78	2.20	2.79
L1	1.40 REF.		
L2	1.50 REF.		
Q	-	2.49	2.70

Package of Dimension

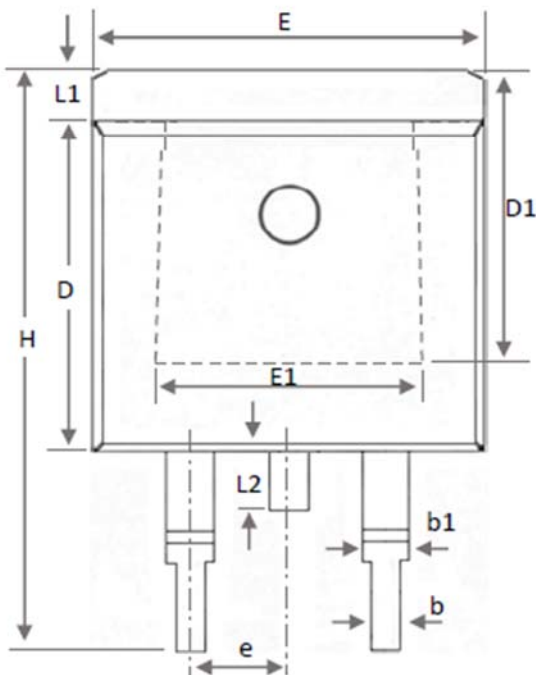
TO-263

G-TYPE



Symbol	Min	Nor	Max
A	4.24	4.51	4.77
A1	0.00	0.13	0.25
b	0.70	0.83	0.96
b1	1.17	1.46	1.75
b2	1.20	1.45	1.70
c	0.30	0.45	0.60
c2	1.15	1.29	1.42
D	8.50	8.76	9.02
D1	6.60	7.13	7.65
E	9.86	10.11	10.36
E1	6.89	7.39	7.89
e	2.54 BSC		
H	14.61	15.25	15.88
L	1.78	2.29	2.79
L1	1.07	1.27	1.47
L2	1.40	1.55	1.70
Q	2.30	2.60	2.89

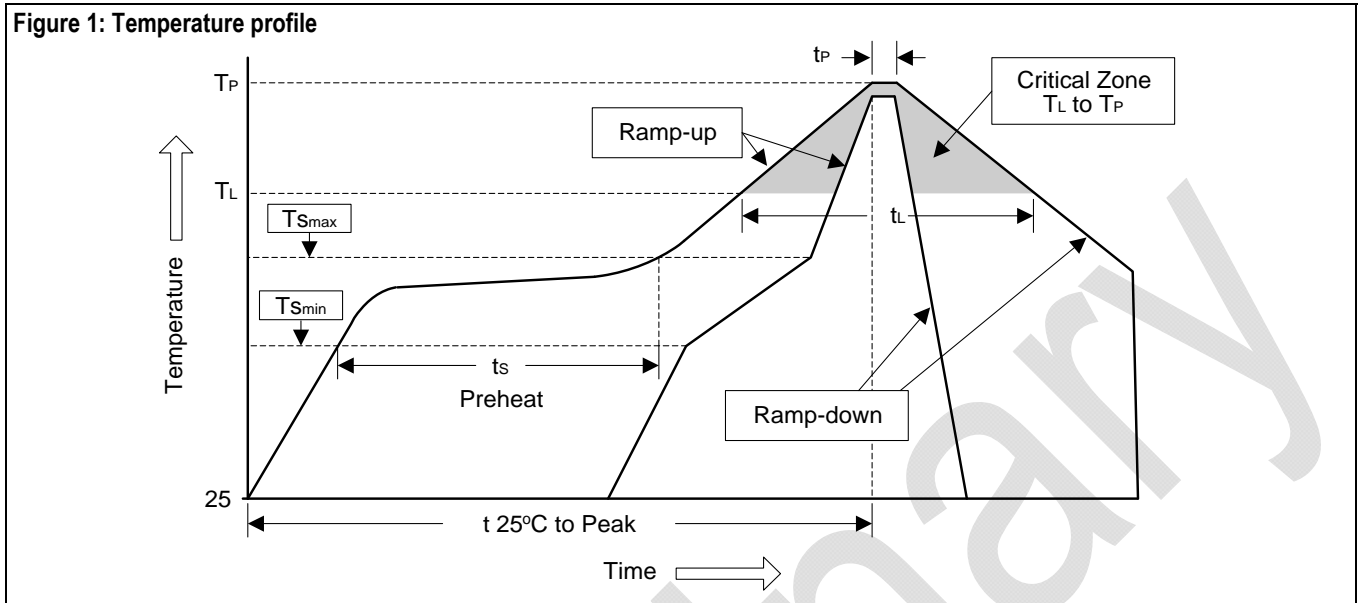
H-TYPE



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

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		
- 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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