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HM5N20I/HM5N20K

HM5N20I   HM5N20K

RoHS COMPLIANT

Features:

☐ Low Intrinsic Capacitances.

☐ Excellent Switching Characteristics.

☐ Extended Safe Operating Area.

☐ Unrivalled Gate Charge :Qg=12nC (Typ.).

☐ BVDSS=200V,I_D=5A

☐ R_{DS}(on) : 0.58Ω (Max) @V_G=10V

☐ 100% Avalanche Tested

TO-251   TO-252

D(2)

G(1)

S(3)
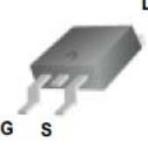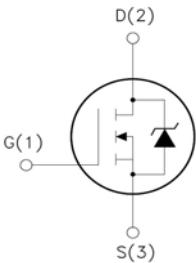
1.Gate   (G)
2.Drain   (D)
3.Source (S)

Drain-Source Voltage	V_{DSS}	200	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current-Continuous	I_D	5	A
Drain Current-Pulsed [Note 1]	I_{DM}	20	A
Maximum Power Dissipation	P_D	30	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient [Note 2]	$R_{\theta JA}$	4.17	℃/W

Electrical Characteristics (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=200V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics [(Note 3)]						
Gate Threshold Voltage	V_{GSS}	V_{DS}=V_{GS},I_D=250μA	2.0		4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	520	580	mΩ
Forward Transconductance	g_{FS}	V_{DS}=15V,I_D=2A	-	8	-	S
Dynamic Characteristics [(Note4)]						
Input Capacitance	C_{Iss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	580	-	PF
Output Capacitance	C_{oss}		-	90	-	PF
Reverse Transfer Capacitance	C_{rss}		-	3	-	PF
Switching Characteristics [(Note 4)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=100V, R_L=15Ω V_{GS}=10V,R_G=2.5Ω	-	10	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	nS
Turn-Off Fall Time	t_f		-	15	-	nS
Total Gate Charge	Q_g	V_{DS}=100V,I_D=2A, V_{GS}=10V	-	12		nC
Gate-Source Charge	Q_{gs}		-	2.5	-	nC
Gate-Drain Charge	Q_{gd}		-	3.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage [(Note 3)]	V_{SD}	V_{GS}=0V,I_S=2A	-	-	1.2	V
Diode Forward Current [(Note 2)]	I_S		-	-	5	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

**4.** Guaranteed by design, not subject to production

Typical Characteristics
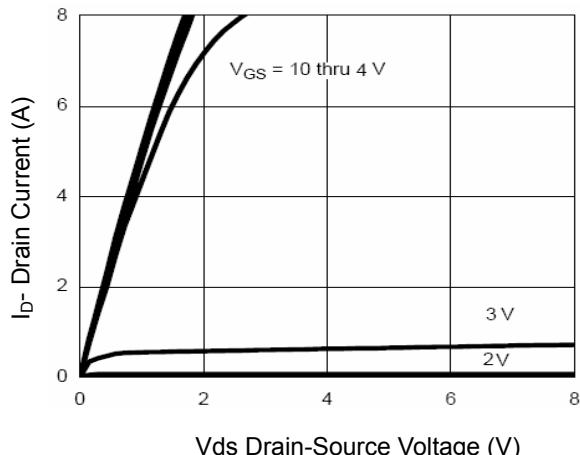
Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics
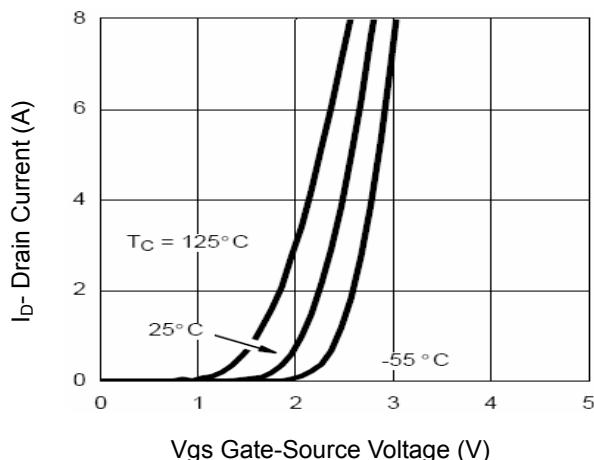
Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics
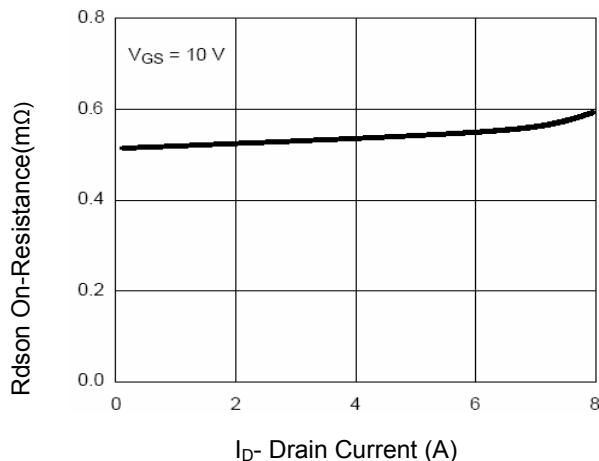
I_D- Drain Current (A)
Figure 3 Rdson- Drain Current
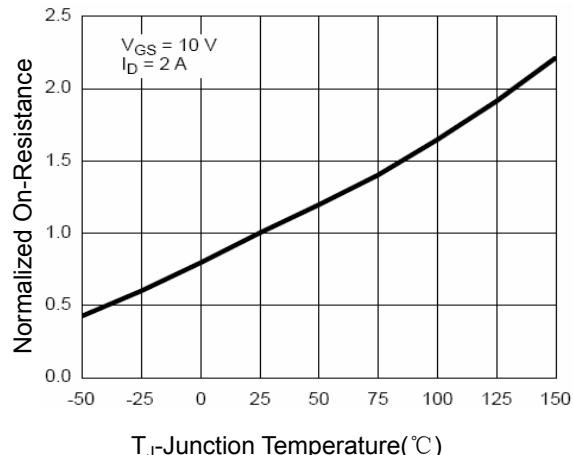
T_J-Junction Temperature(℃)
Figure 4 Rdson-JunctionTemperature

Qg Gate Charge (nC)
**Figure 5 Gate Charge**
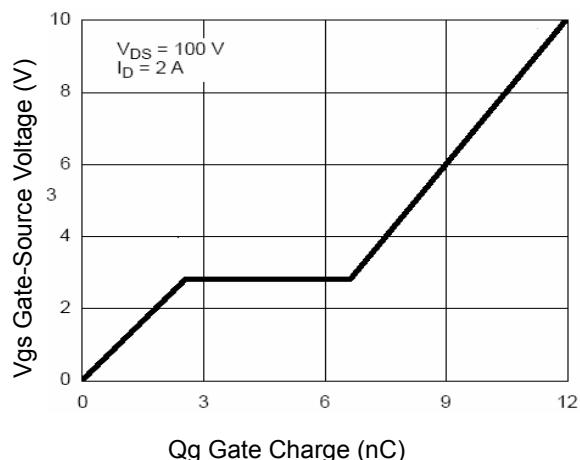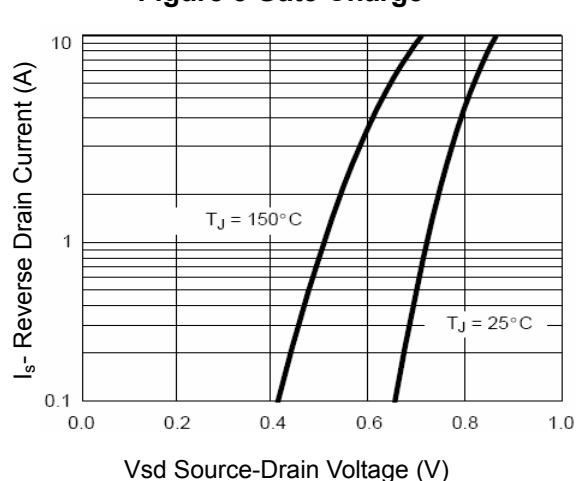
Vsd Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward

Typical Characteristics (Continued)
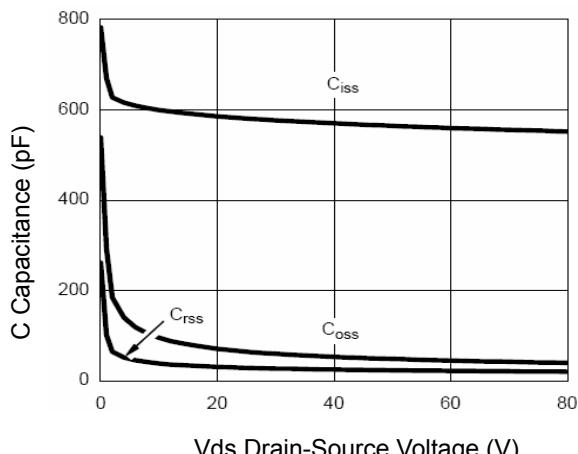
**Figure 7 Capacitance vs Vds**
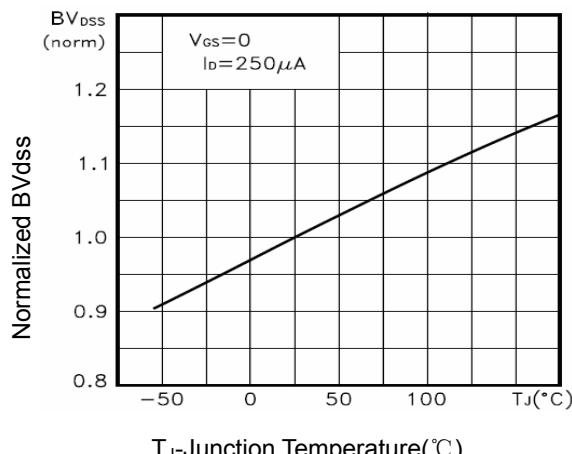
Figure 9 BV$_{DSS}$ vs Junction Temperature
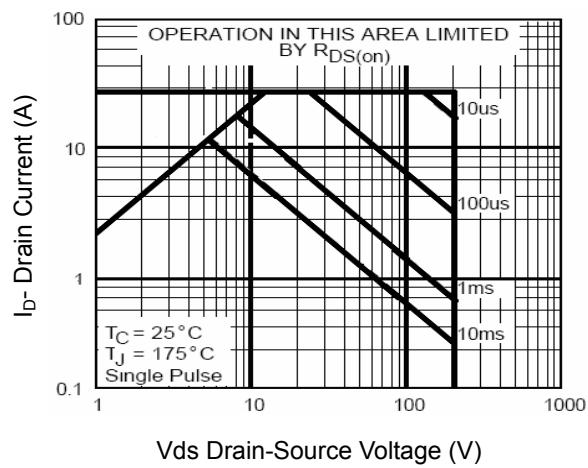
Figure 8 Safe Operation Area
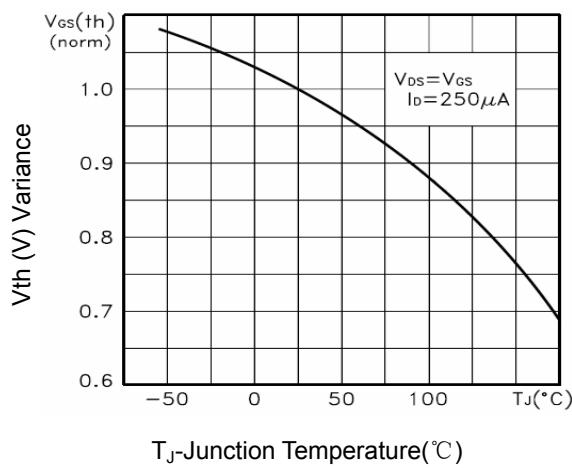
Figure 10 V$_{GS(th)}$ vs Junction Temperature
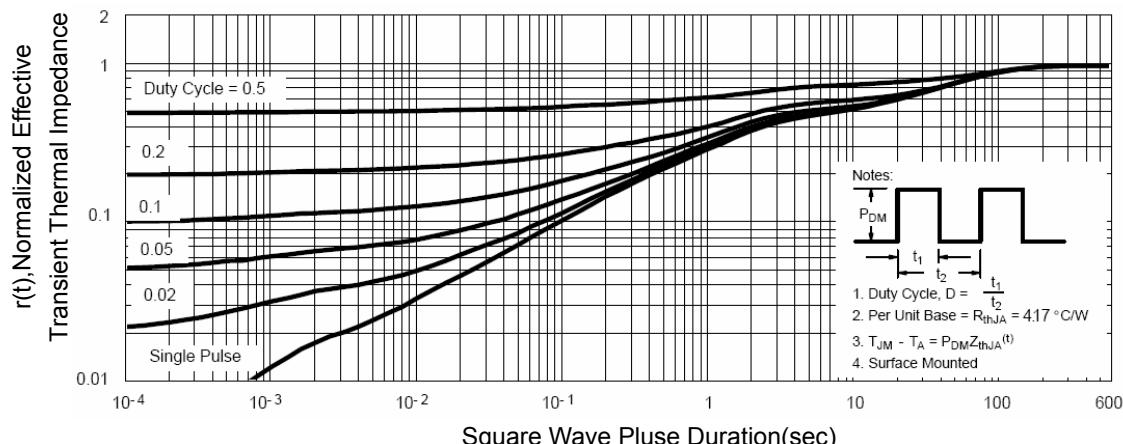
**Figure 11 Normalized Maximum Transient Thermal Impedance**

Notes:
1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R$_{thJA}$ = 4.17 °C/W
3. T$_{JM}$ - T$_A$ = P$_{DM}$Z$_{thJA}$(t)
4. Surface Mounted

Test Circuit

1）E$_{AS}$ test circuit
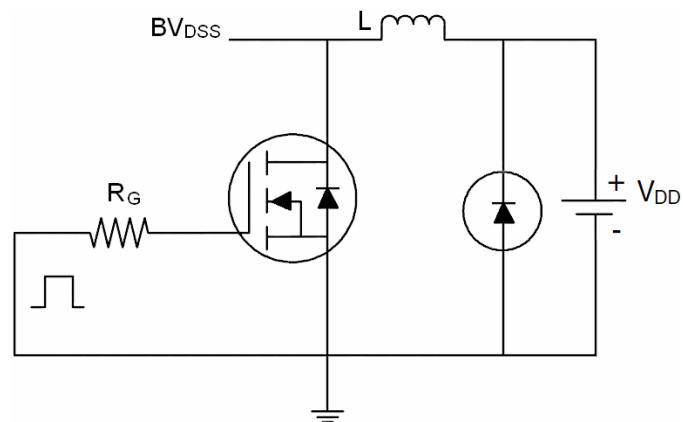
2）Gate charge test circuit
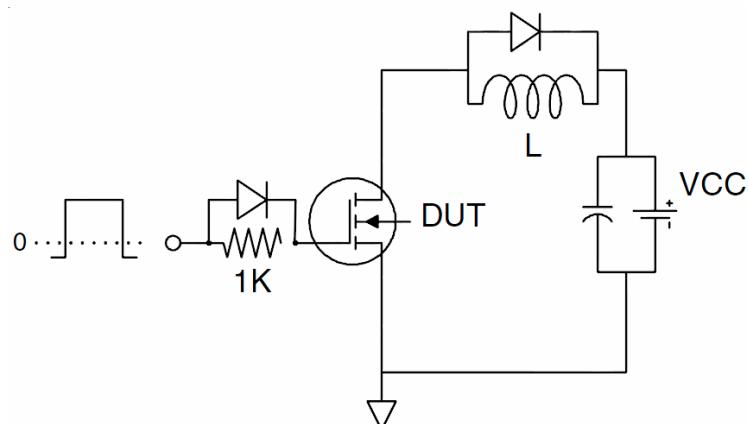
3）Switch Time Test Circuit
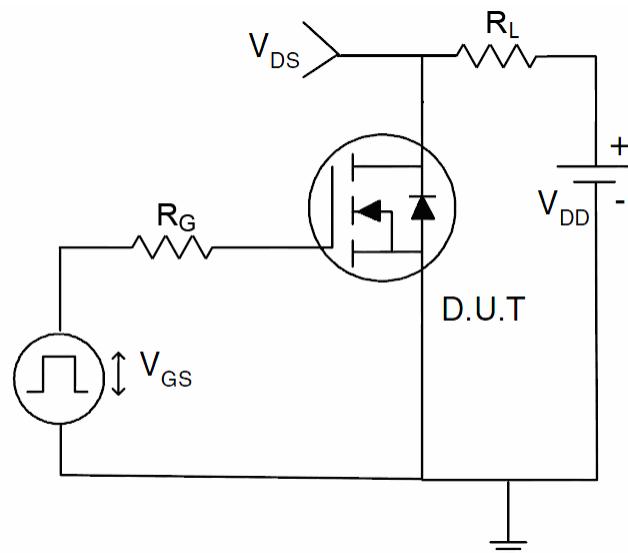
Package Dimension

TO-251

Units：mm
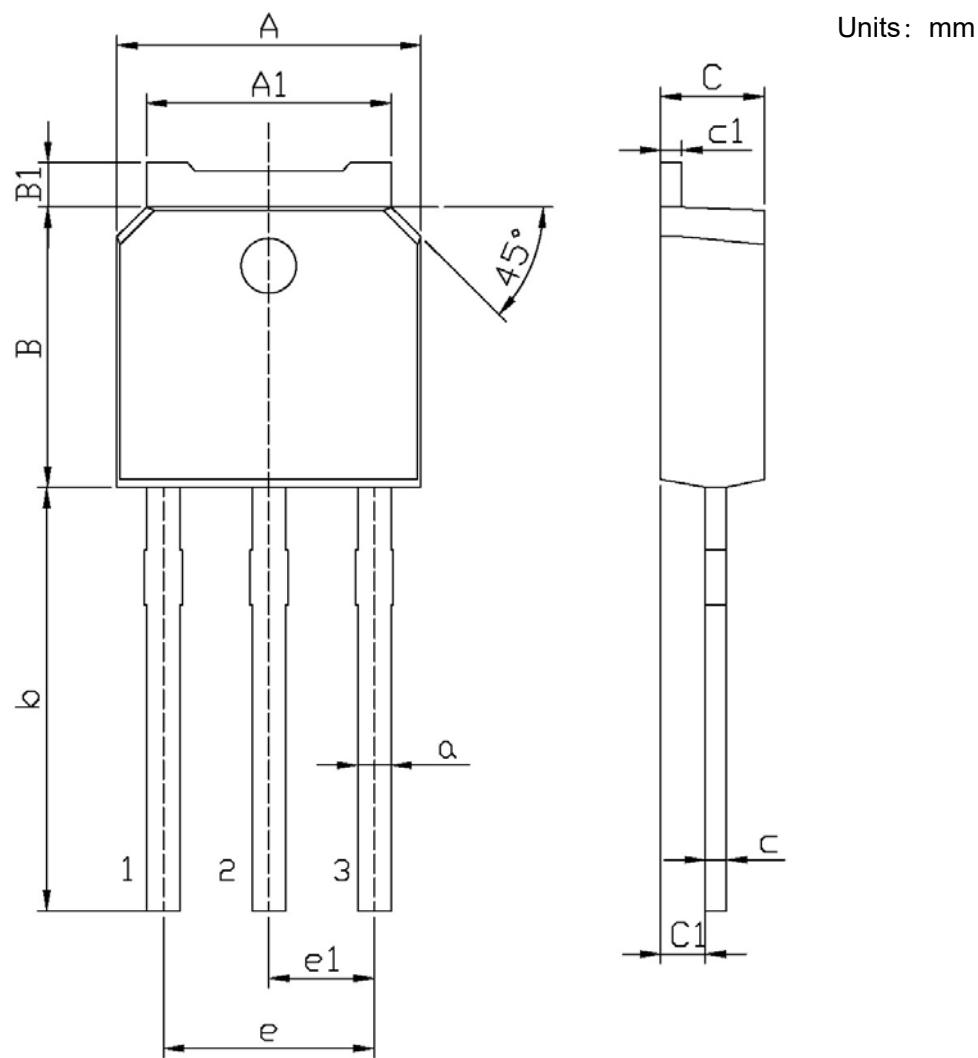
Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.70	0.90
A1	5.20	5.40	b	9.00	9.40
B	5.95	6.25	c	0.45	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e1	2.24	2.34
C1	0.95	1.15	e	4.43	4.73

Package Dimension

TO-252

Units：mm
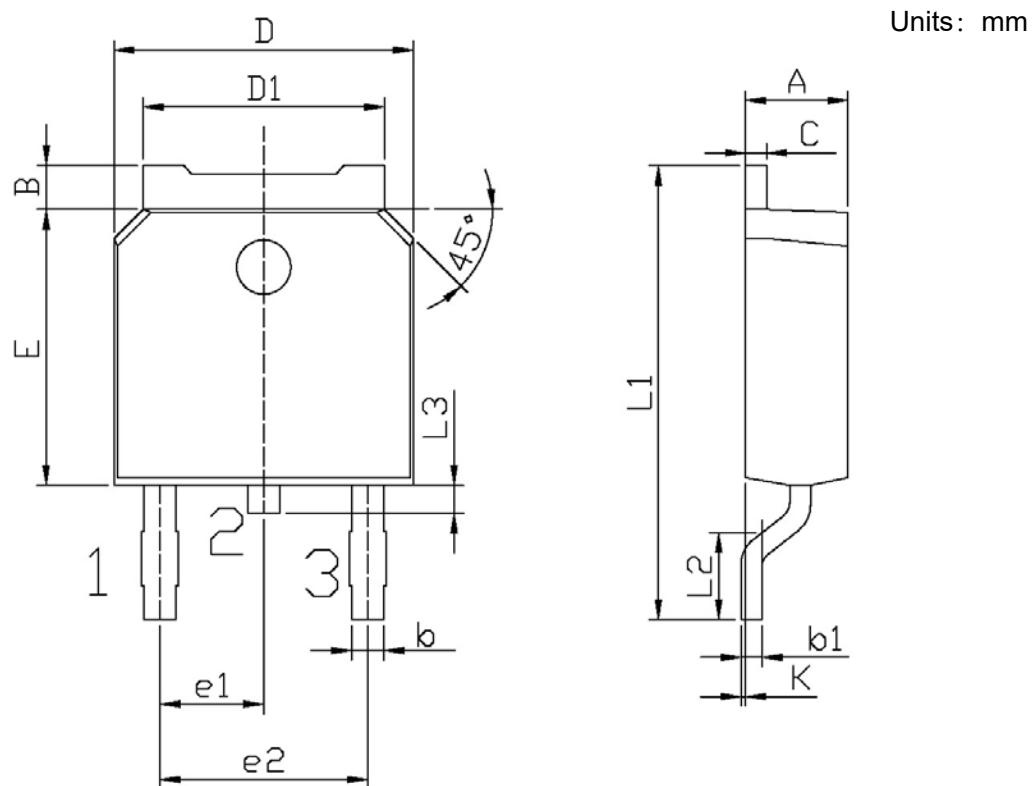
Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.20	5.40	K	0.00	0.10