

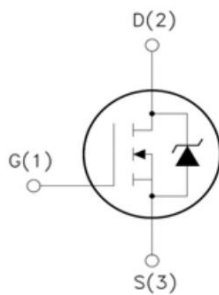
Descriptions

This is 200V 40A N-CHANNEL MOSFET in a TO-220 Plastic Package.

Features

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg= 126nC (Typ.).
- BVDSS=200V, I_D=40A
- R_{DS(on)} : 0.06Ω (Max) @V_G=10V
- 100% Avalanche Tested

Equivalent Circuit & Pinning



TO-220 1.Gate(G) 2.Drain(D) 3.Source(S)

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	200	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	40	A
Drain Current-Continuous(T _C = 100°C)	I _D (100°C)	28	A
Pulsed Drain Current	I _{DM}	160	A
Maximum Power Dissipation	P _D	220	W
Derating factor		1.47	W/°C
Single pulse avalanche energy ^(Note 5)	E _{AS}	605	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 175	°C

Thermal Characteristic

Thermal Resistance,Junction-to-Case ^(Note 2)	R _{θJC}	0.63	°C/W
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Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	200	220	-	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 _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	50	60	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =20A	26	-	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	3140	-	PF
Output Capacitance	C _{oss}		-	360	-	PF
Reverse Transfer Capacitance	C _{rss}		-	140	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =100V, I _D =40A V _{GS} =10V, R _G =25Ω	-	35	-	nS
Turn-on Rise Time	t _r		-	60	-	nS
Turn-Off Delay Time	t _{d(off)}		-	101	-	nS
Turn-Off Fall Time	t _f		-	95	-	nS
Total Gate Charge	Q _g	V _{DS} =160V, I _D =40A, V _{GS} =10V	-	163	-	nC
Gate-Source Charge	Q _{gs}		-	31	-	nC
Gate-Drain Charge	Q _{gd}		-	64	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =40A	-	-	1.4	V
Diode Forward Current ^(Note 2)	I _S	TJ = 25°C	-	-	40	A
Reverse Recovery Time	t _{rr}	TJ = 25°C, IF = 40A di/dt = 100A/μs ^(Note3)	-	250	-	nS
Reverse Recovery Charge	Q _{rr}		-	2	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS}= 20A, V_{DD}= 50V, R_G= 25 \Omega$, Starting $T_J= 25^\circ C$
3. Pulse Test: Pulse width $\leq 250 \mu s$, Duty Cycle $\leq 1\%$

Electrical Characteristic Curve

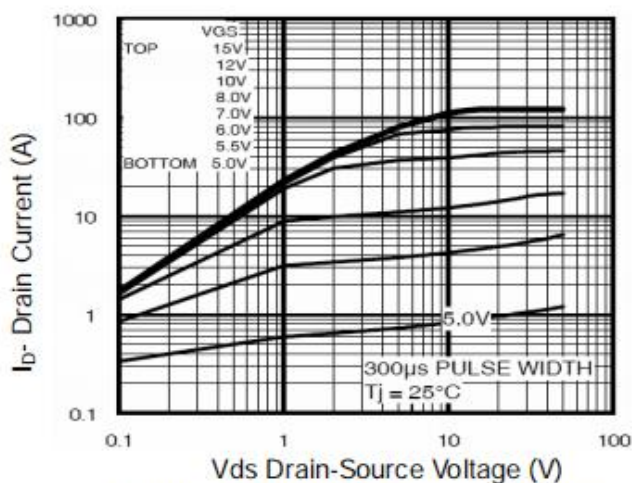


Figure 1 Output Characteristics

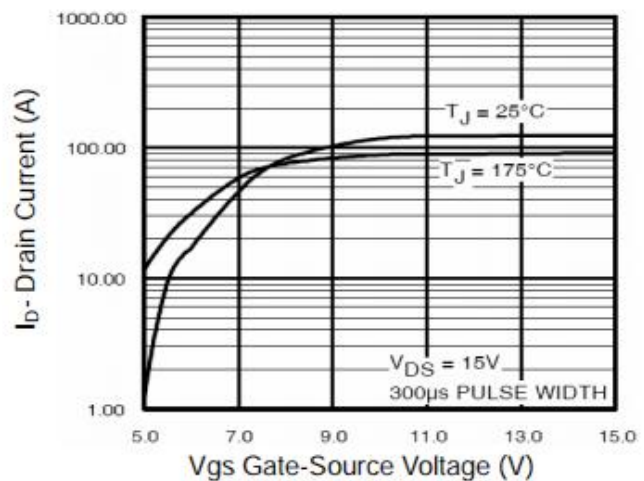


Figure 2 Transfer Characteristics

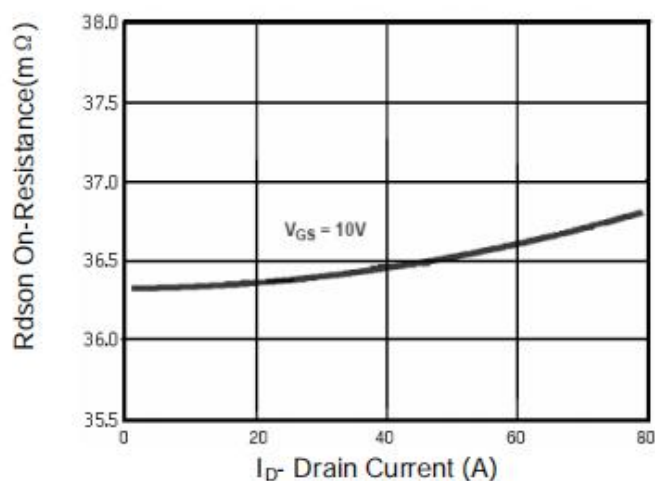


Figure 3 $R_{DS(on)}$ - Drain Current

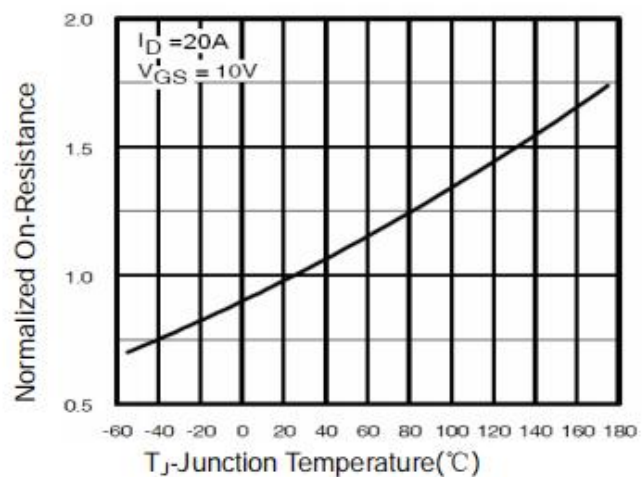


Figure 4 $R_{DS(on)}$ -Junction Temperature

Electrical Characteristic Curve

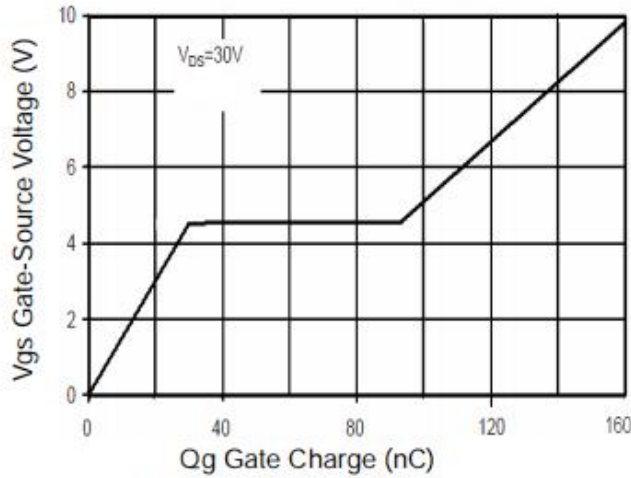


Figure 5 Gate Charge

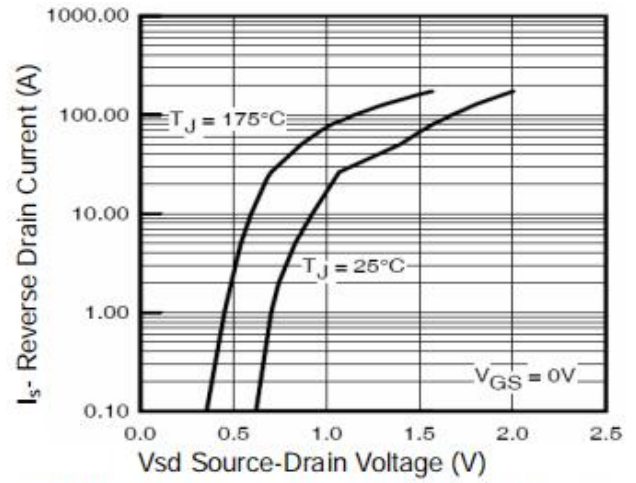


Figure 6 Source- Drain Diode Forward

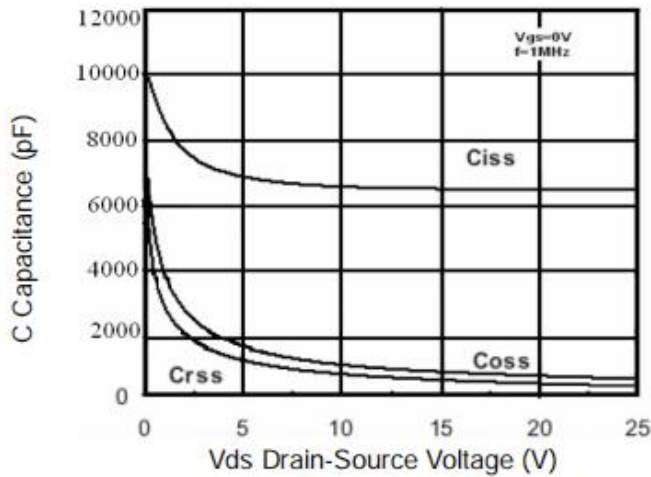


Figure 7 Capacitance vs Vds

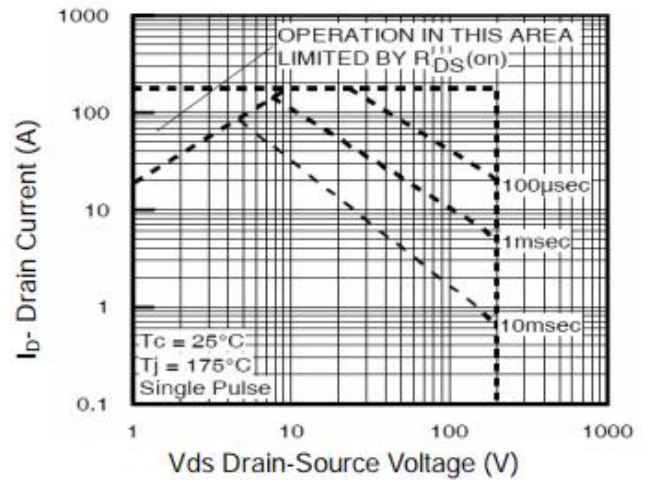


Figure 8 Safe Operation Area

Electrical Characteristic Curve

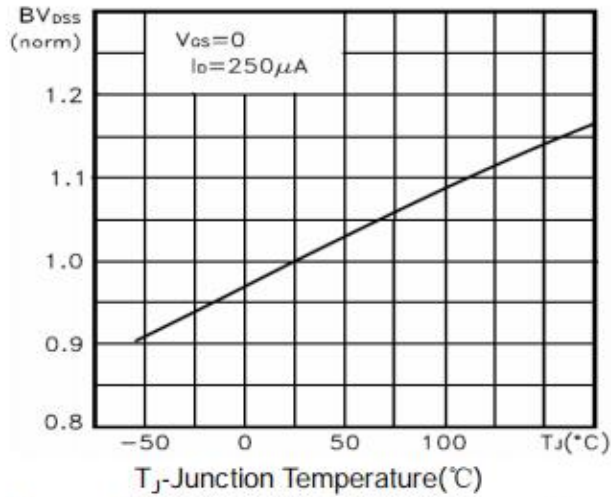


Figure 9 BV_{DSS} vs Junction Temperature

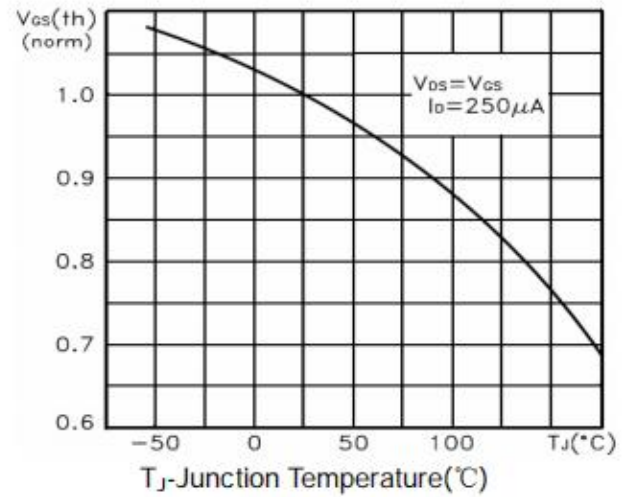


Figure 10 $V_{GS(th)}$ vs Junction Temperature

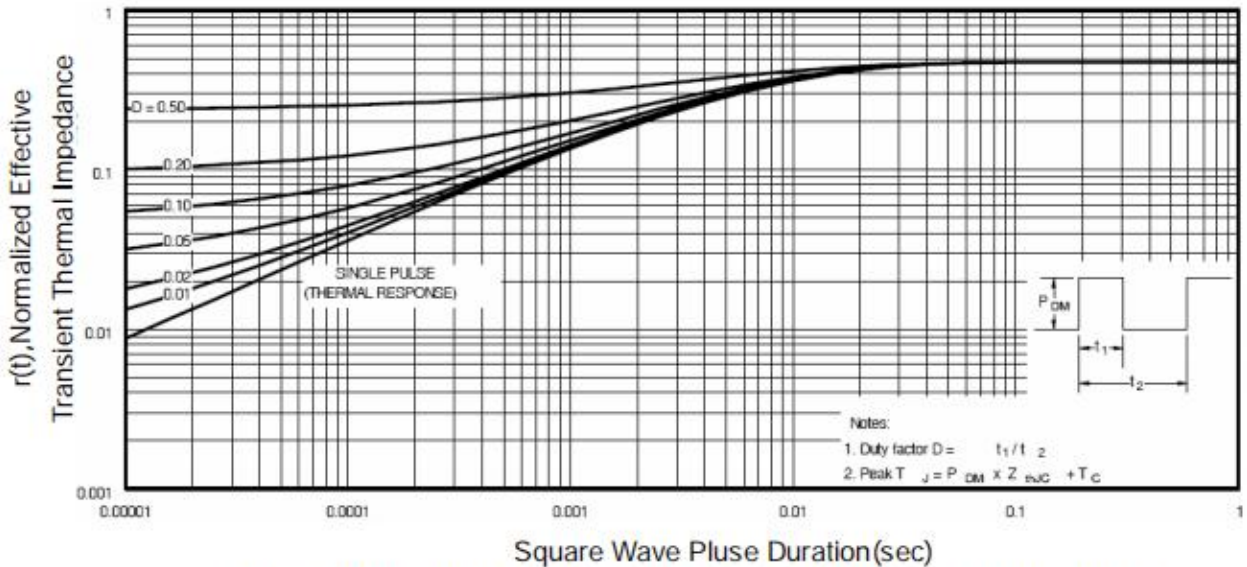
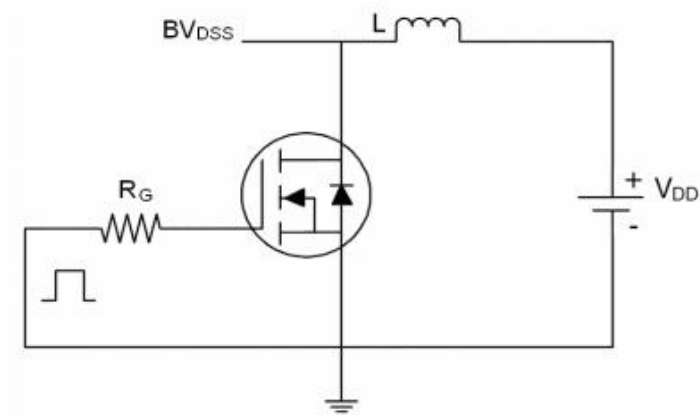
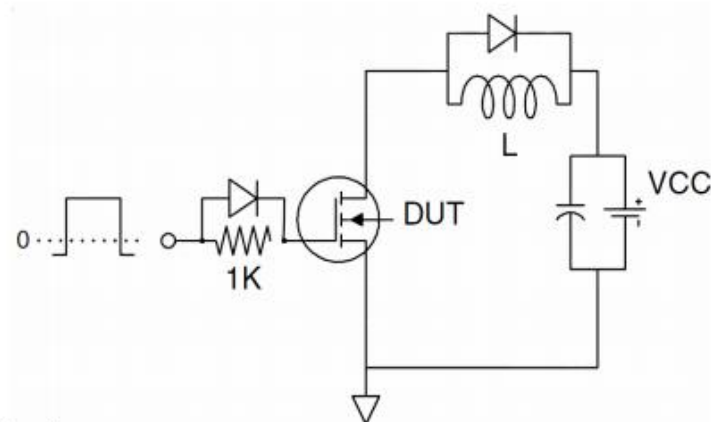


Figure 11 Normalized Maximum Transient Thermal Impedance

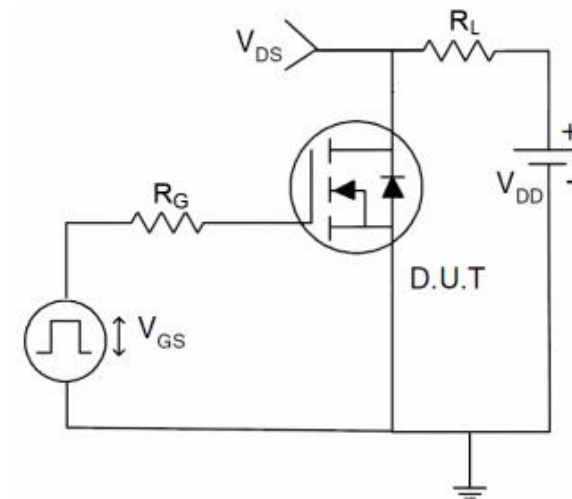
Test Circuit

1) E_{AS} test Circuits

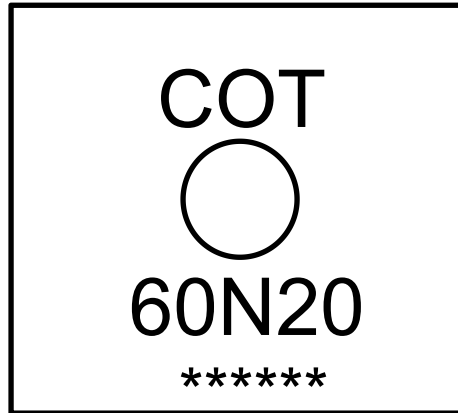
2) Gate charge test Circuit



3) Switch Time Test Circuit



Marking Instructions



Note:

COT:

60N20:

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Company Code

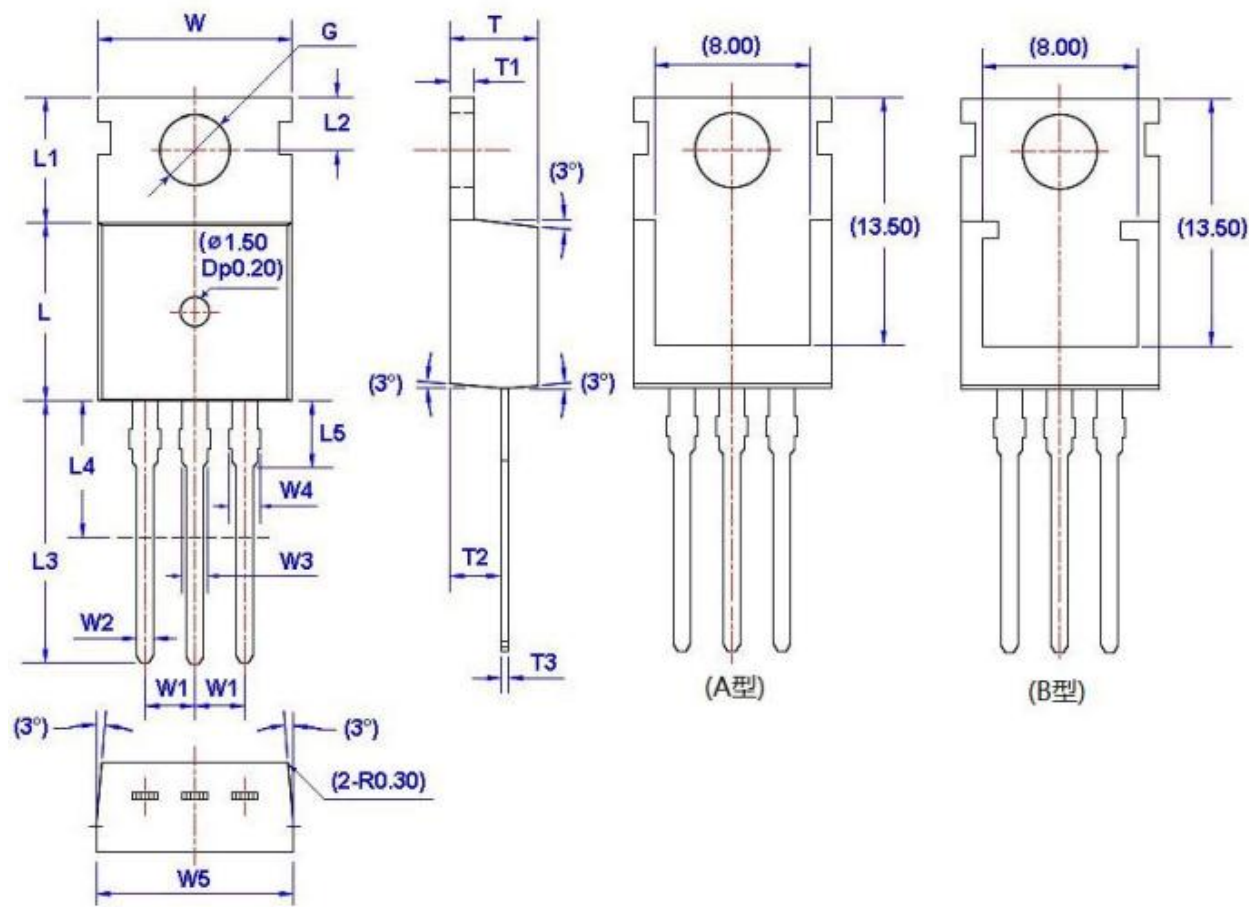
Product Type Code

*: Inner Code * : Year Code **: Week Code **: Lot Code.

Package Outline Dimensions

TO-220

Unit:mm



符号	尺寸		符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54 (TYP)		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70	14.27	T2	2.20	2.60			