XXW160N06

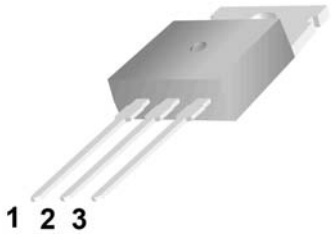
60V N-Channel MOSFET

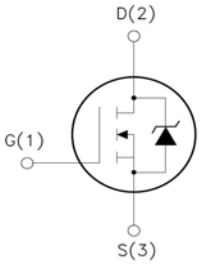
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 152nC (Typ.).
- ☐ BVDSS=60V,I_D=160A
- ☐ R_{DS}(on) : 4.0mΩ (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-220

RoHS COMPLIANT





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

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

Symbol	Parameter		Maximum	Unit
V_{DSS}	Drain-to-Source Voltage		60	V
V_{GSS}	Gate-to-Source Voltage		±20	V
I_D[3]	Continuous Drain Current	T_C=25°C	160	A
		T_C=100°C	105	
I_{DP}[4]	Pulsed Drain Current	T_C=25°C	600	
IAS[5]	Avalanche Current		28	
EAS[5]	Avalanche energy		900	mJ
PD	Maximum Power Dissipation	T_C=25°C	200	W
		T_C=100°C	92.5	
T_J, T_{STG}	Junction & Storage Temperature Range		-55~175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθjc	Thermal Resistance-Junction to Case	0.68	℃/W
Rθja	Thermal Resistance-Junction to Ambient	62.5	

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

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	60	—	—	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	—	—	1	uA
		T_J=125°C	—	—	100	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2	3	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	—	—	±100	nA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=80A	—	2.9	4.0	mΩ
			—	—	—	
Diode Characteristics						
V_{SD}[1]	Diode Forward Voltage	I_{SD}=80A,V_{GS}=0V	—	0.88	1.2	V
I_S[3]	Diode Continuous Forward Current		—	—	160	A
t_{rr}	Reverse Recovery Time	I_F=80A,TJ=25°C	—	73	—	nS
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/us	—	98	—	nC
Dynamic Characteristics[2]						
R_G	Gate Resistance	V_{GS}=0V, V_{DS}=0V, Frequency=1MHz	—	0.7	—	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V Frequency=1MHz	—	7820	—	pF
C_{oss}	Output Capacitance		—	634	—	
C_{rss}	Reverse Transfer Capacitance		—	502	—	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,RL=0.4Ω V_{GS}=10V,R_G=2.5Ω	—	31	—	nS
t_r	Rise Time		—	29	—	
$t_{d(off)}$	Turn-Off Delay Time		—	110	—	
t_f	Fall Time		—	46	—	
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=30V,V_{GS}=10V I_D=160A	—	152	—	nC
Q_{gs}	Gate-to-Source Charge		—	33	—	
Q_{gd}	Gate-to-Drain Charge		—	55	—	

Note: 1: Pulse test; pulse width ≦ 300us, duty cycle ≦ 2%.
2: Guaranteed by design, not subject to production testing.
3: Package limitation current is 75A.Calculated continuous current based on maximum allowable junction temperature.
4: Repetitive rating, pulse width limited by max junction temperature.
5: Starting TJ = 25°C,L = 0.5mH

Typical Characteristics

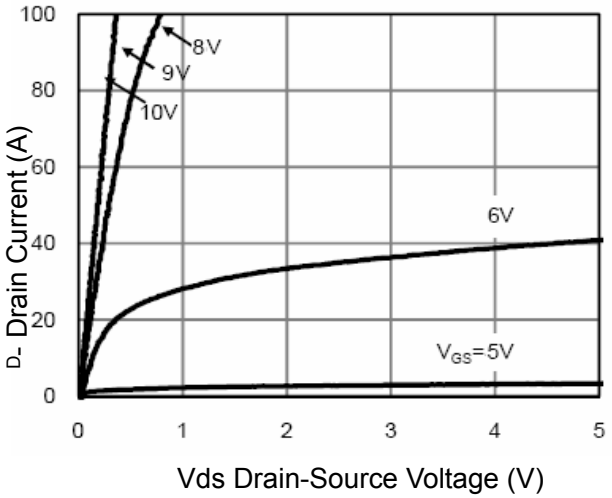


Figure 1 Output Characteristics

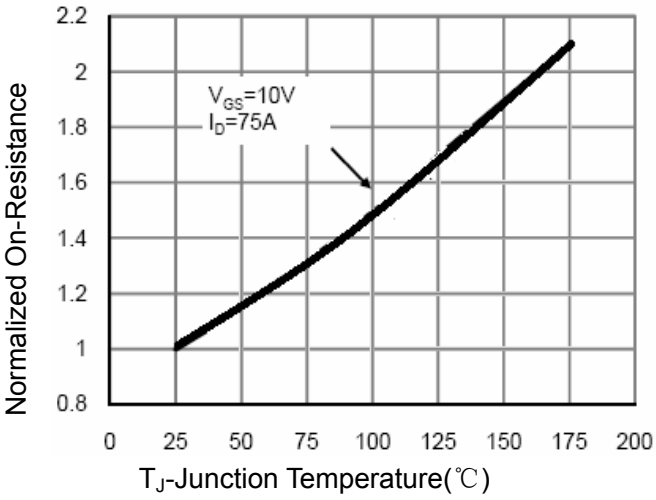


Figure 4 Rdson-JunctionTemperature

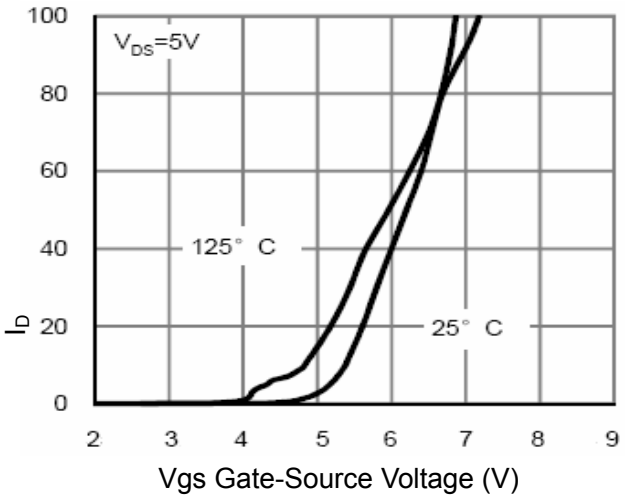


Figure 2 Transfer Characteristics

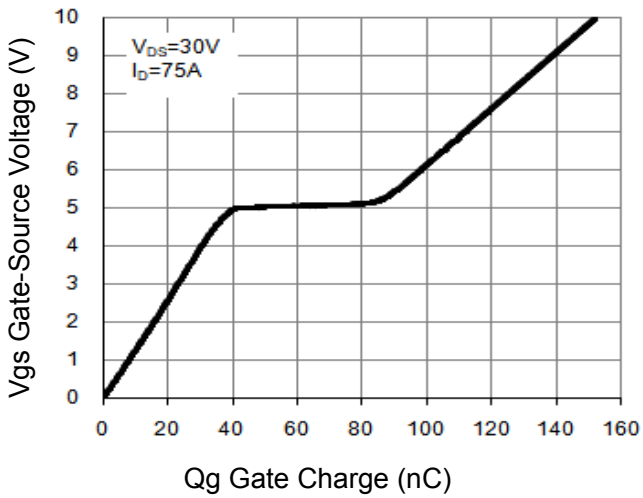


Figure 5 Gate Charge

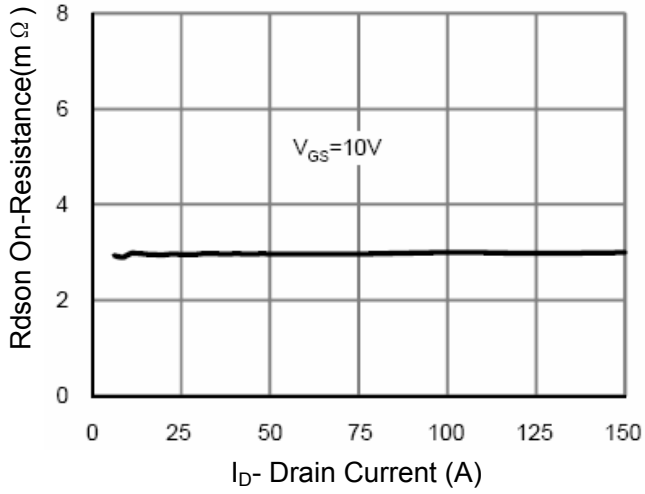


Figure 3 Rdson- Drain Current

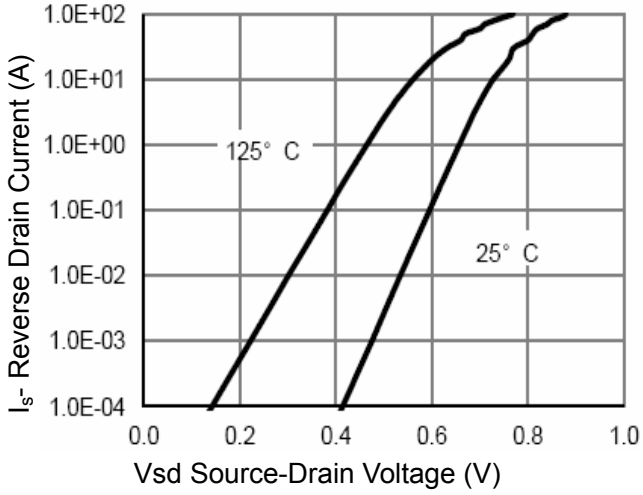


Figure 6 Source- Drain Diode Forward

Typical Characteristics

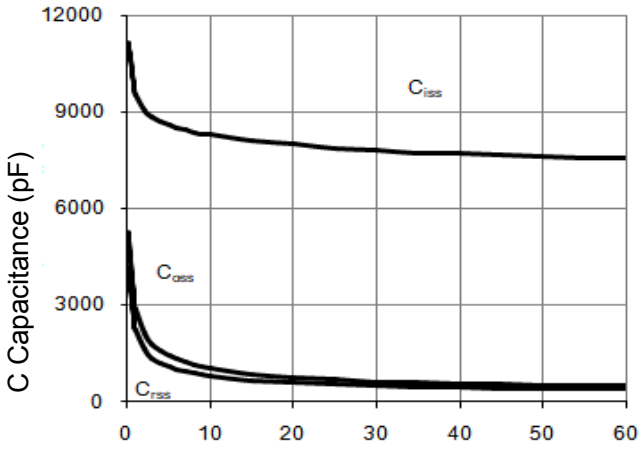


Figure 7 Capacitance vs Vds

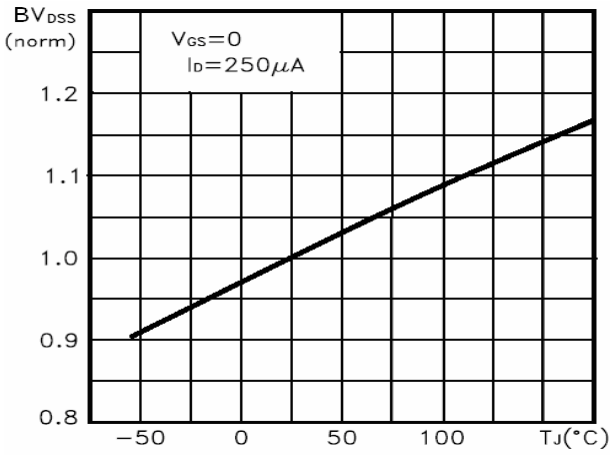


Figure 9 BV_{DSS} vs Junction Temperature

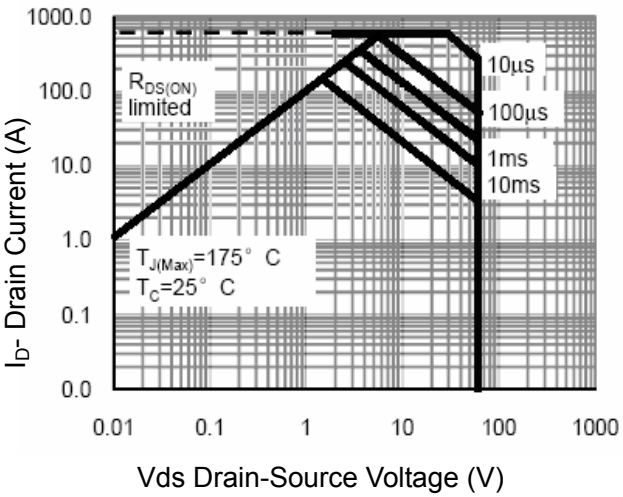


Figure 8 Safe Operation Area

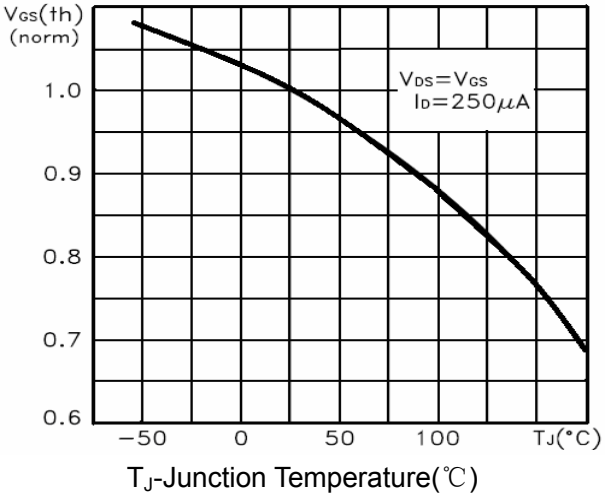


Figure 10 $V_{GS(th)}$ vs Junction Temperature

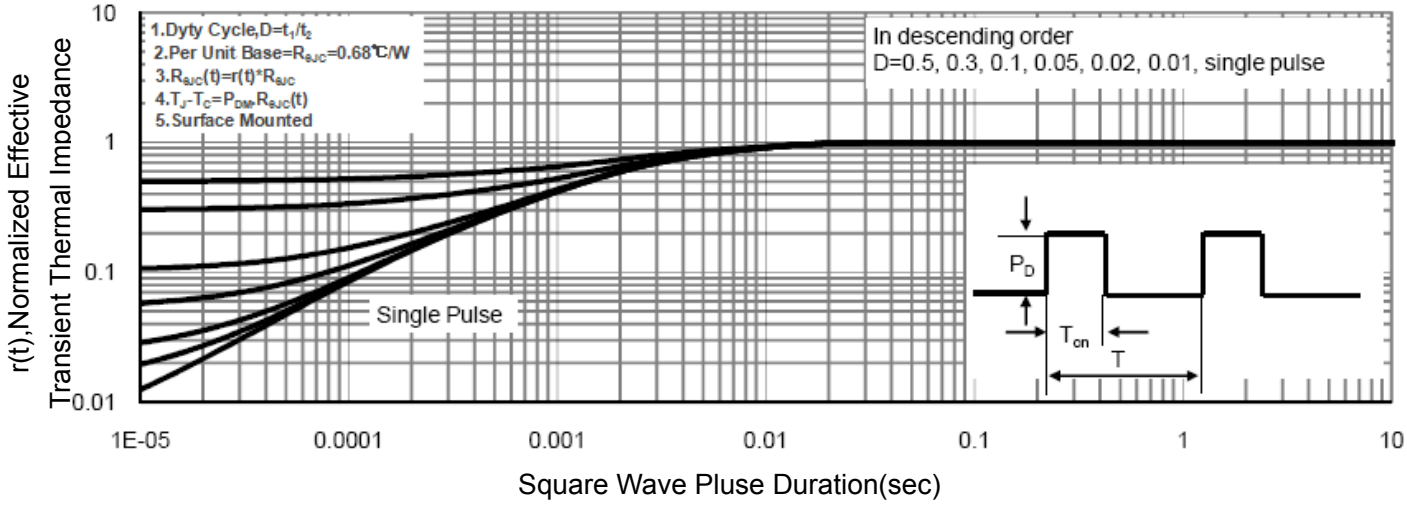
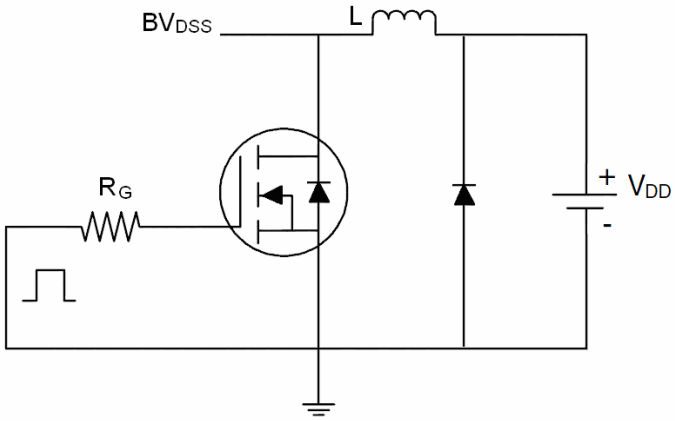


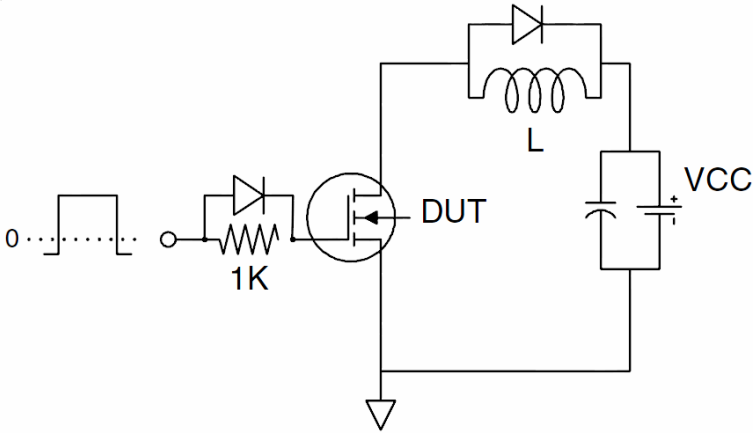
Figure 11 Normalized Maximum Transient Thermal Impedance

Test circuit

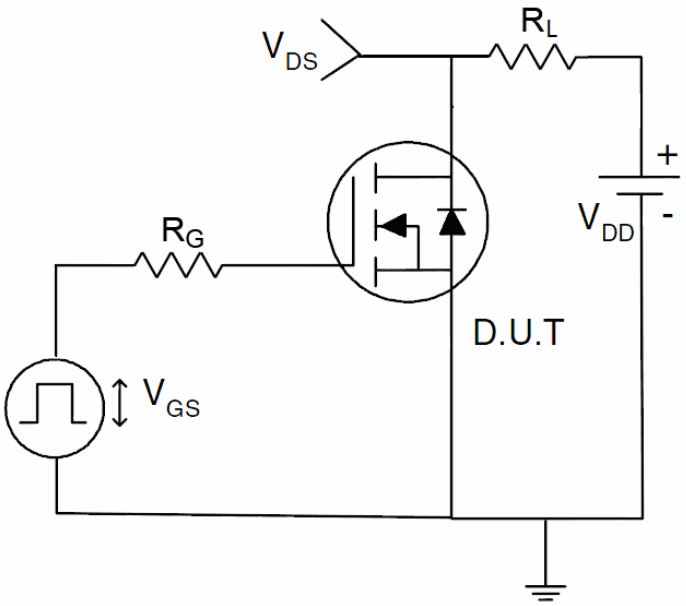
1）E_{AS} test Circuits



2）Gate charge test Circuit:



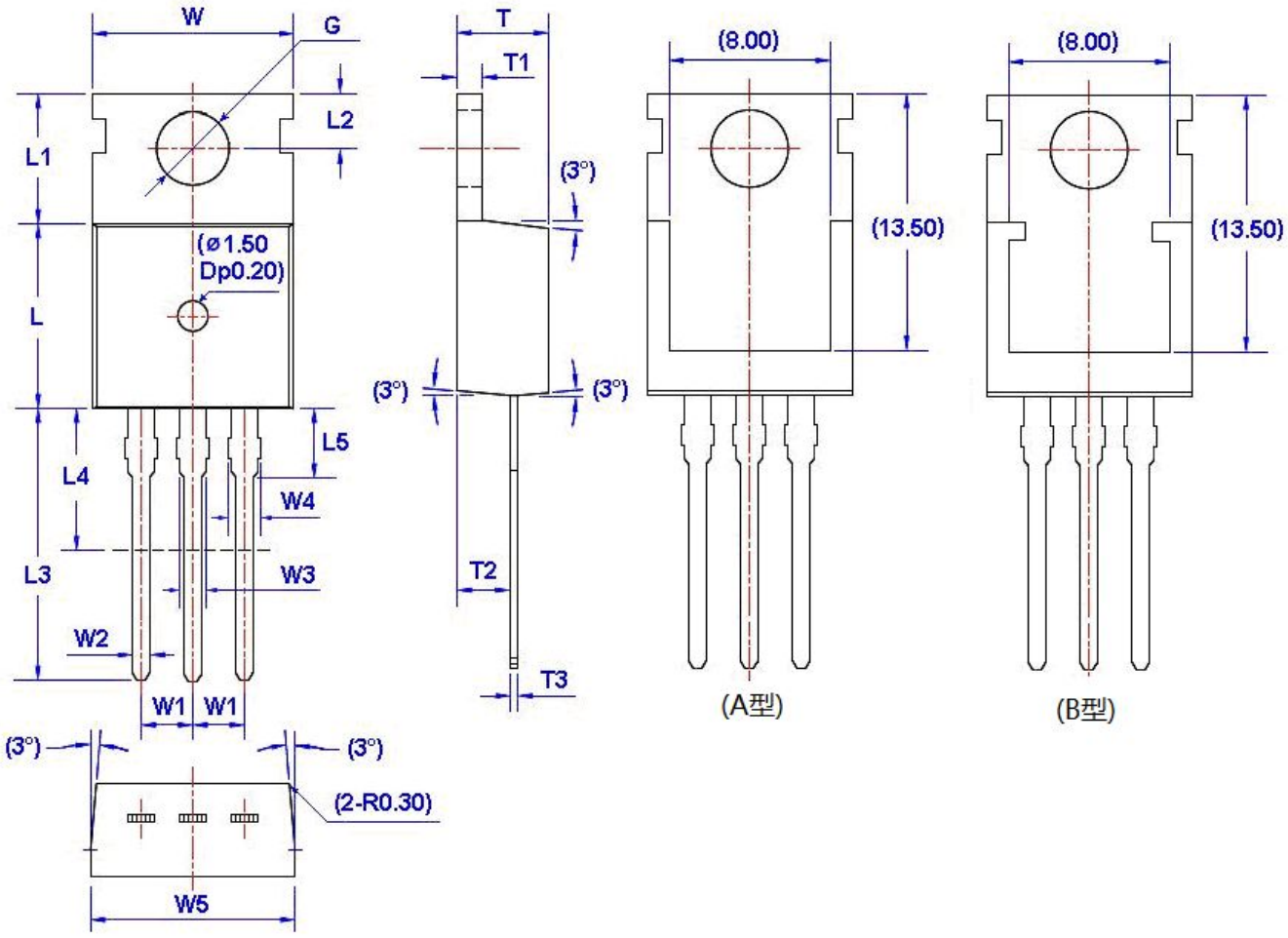
3）Switch Time Test Circuit:



Package Dimension

TO-220

Unit:mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	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			