N-Channel Enhancement Mode Power MOSFET

Description

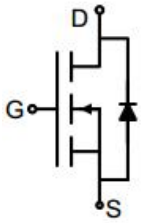
The G030N06T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 60V
- I_D (at V_{GS} = 10V) 223A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 2.7mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 3.5mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TO-220

Ordering Information

Device	Package	Marking	Packaging
G030N06T	TO-220	G030N06	50pcs/Tube

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Continuous Drain Current	T_C = 25ºC	I_D	223	A
	T_C = 100ºC		141	
Pulsed Drain Current (note1)		I_{DM}	892	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	240	W
Single pulse avalanche energy （note2）		E_{AS}	441	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	45	ºC/W
Maximum Junction-to-Case	R_{thJC}	0.52	ºC/W

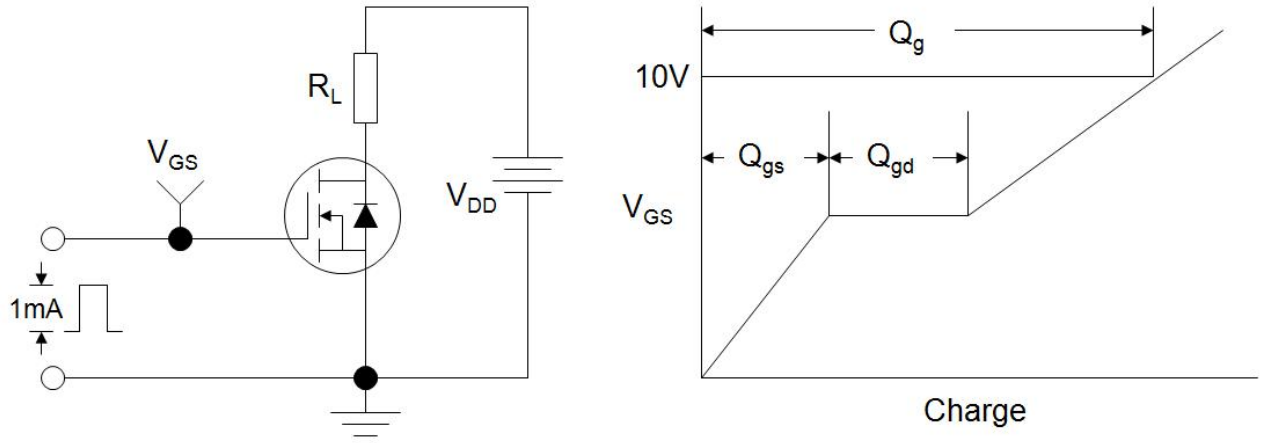
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	2.2	2.7	mΩ
		V_{GS} = 4.5V, I_D = 30A	--	2.8	3.5	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 30A	--	70	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	12000	--	pF
Output Capacitance	C_{oss}		--	1070	--	
Reverse Transfer Capacitance	C_{rss}		--	750	--	
Total Gate Charge	Q_g	V_{DD} = 30V, I_D = 30A, V_{GS} = 4.5V	--	113	--	nC
Gate-Source Charge	Q_{gs}		--	34	--	
Gate-Drain Charge	Q_{gd}		--	48	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 30A, R_G = 2.1Ω	--	73	--	ns
Turn-on Rise Time	t_r		--	244	--	
Turn-off Delay Time	$t_{d(off)}$		--	122	--	
Turn-off Fall Time	t_f		--	122	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	223	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 30A, V_{GS} = 0V di/dt=100A/us	--	344	--	nC
Reverse Recovery Time	Trr		--	69	--	ns

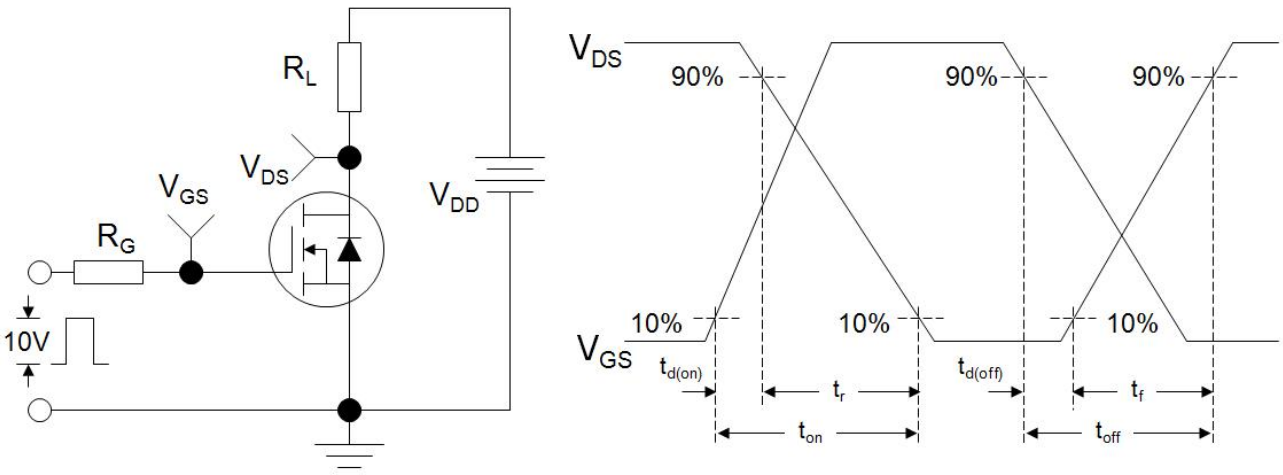
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 1225mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

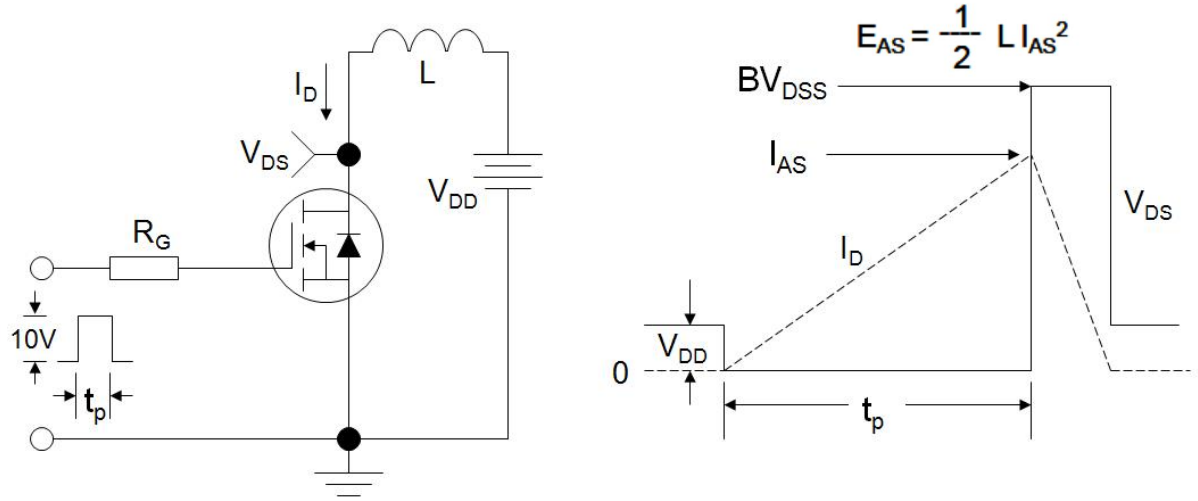
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

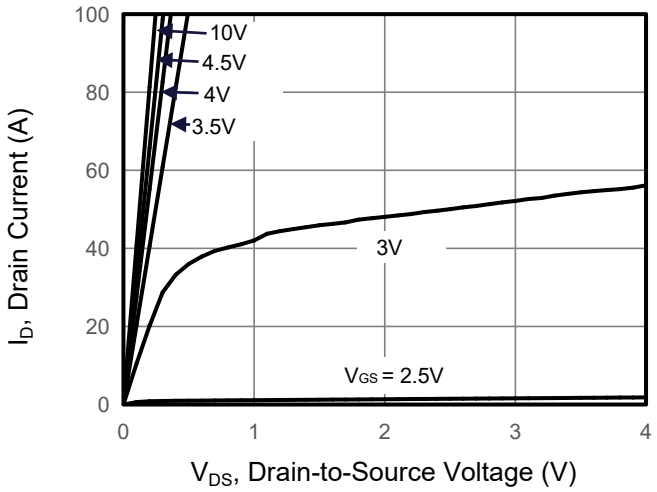


Figure 2. Transfer Characteristics

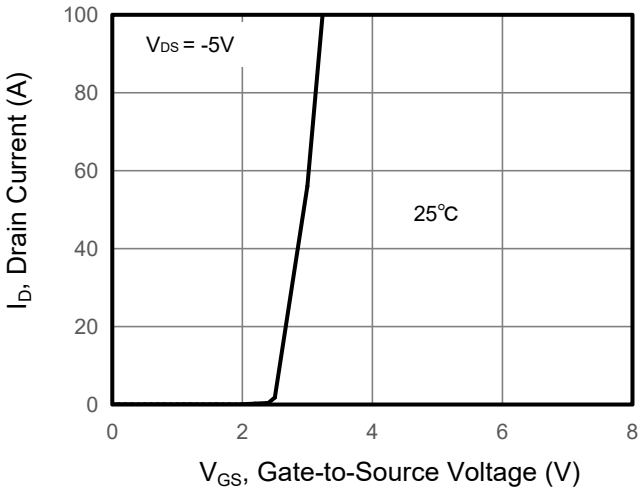


Figure 3. Drain Source On Resistance

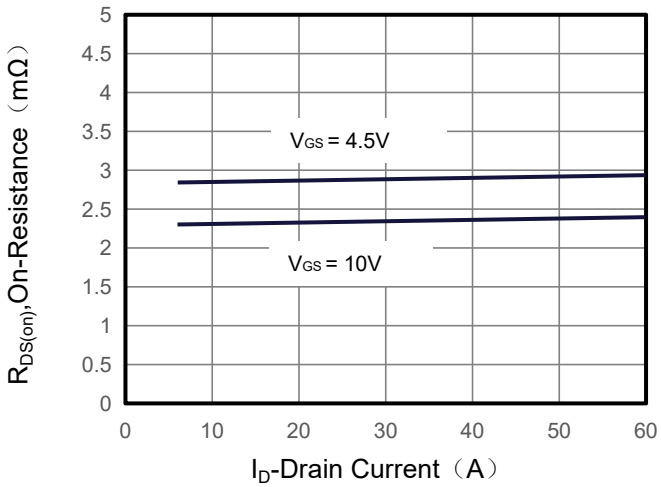


Figure 4. Gate Charge

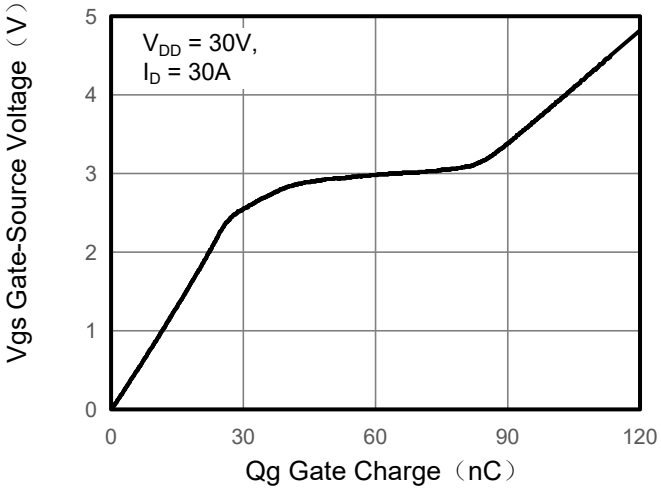


Figure 5. Capacitance

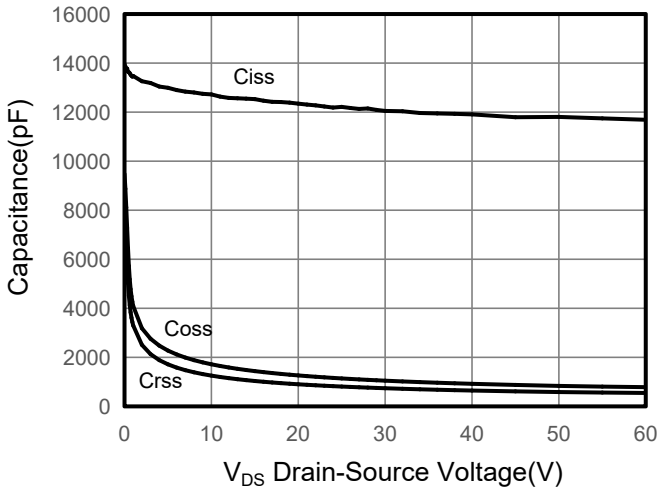
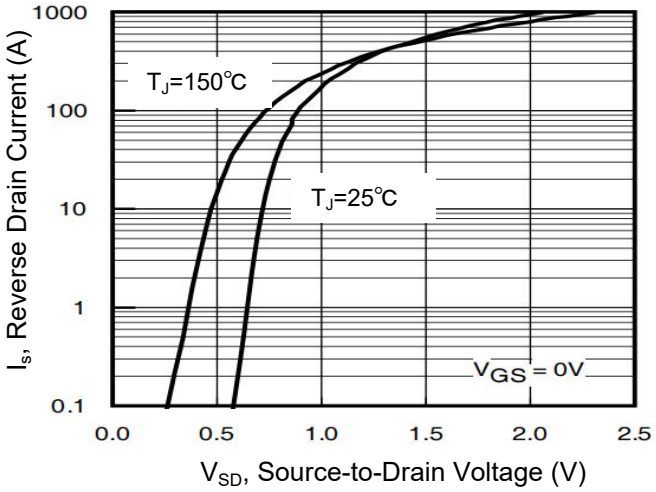


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

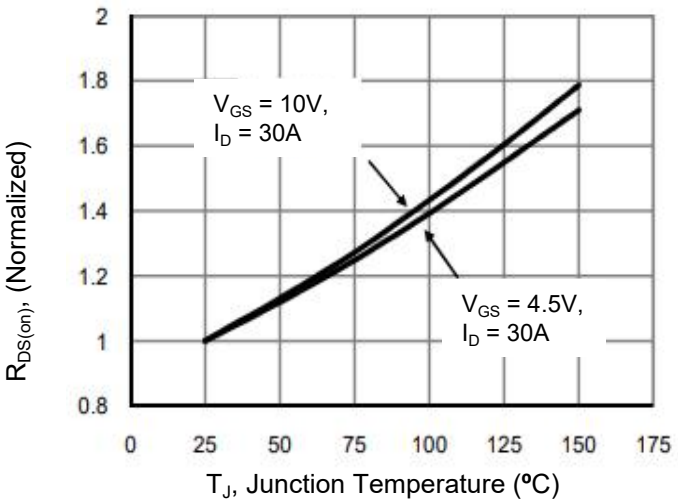


Figure 8. Safe Operation Area

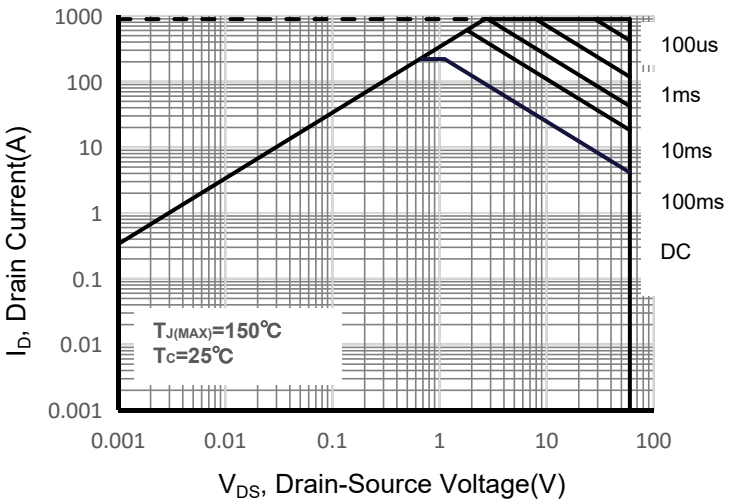


Figure 9. Maximum Continuous Drain Current vs Case Temperature

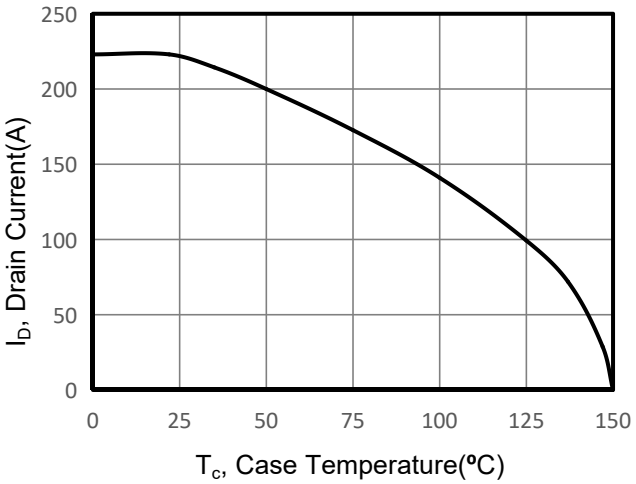
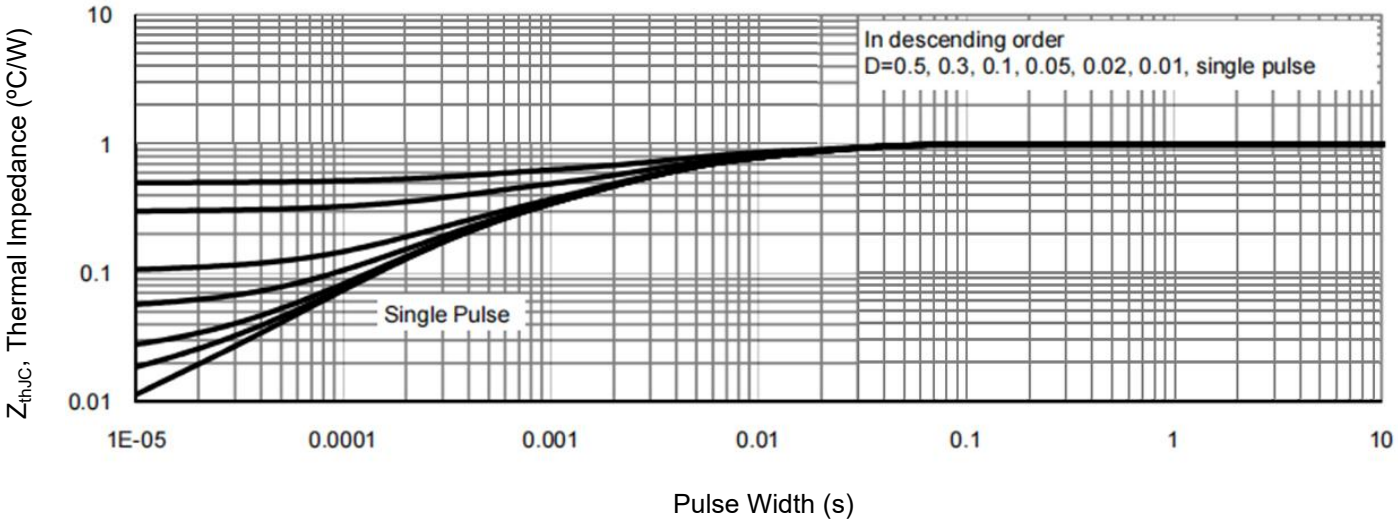
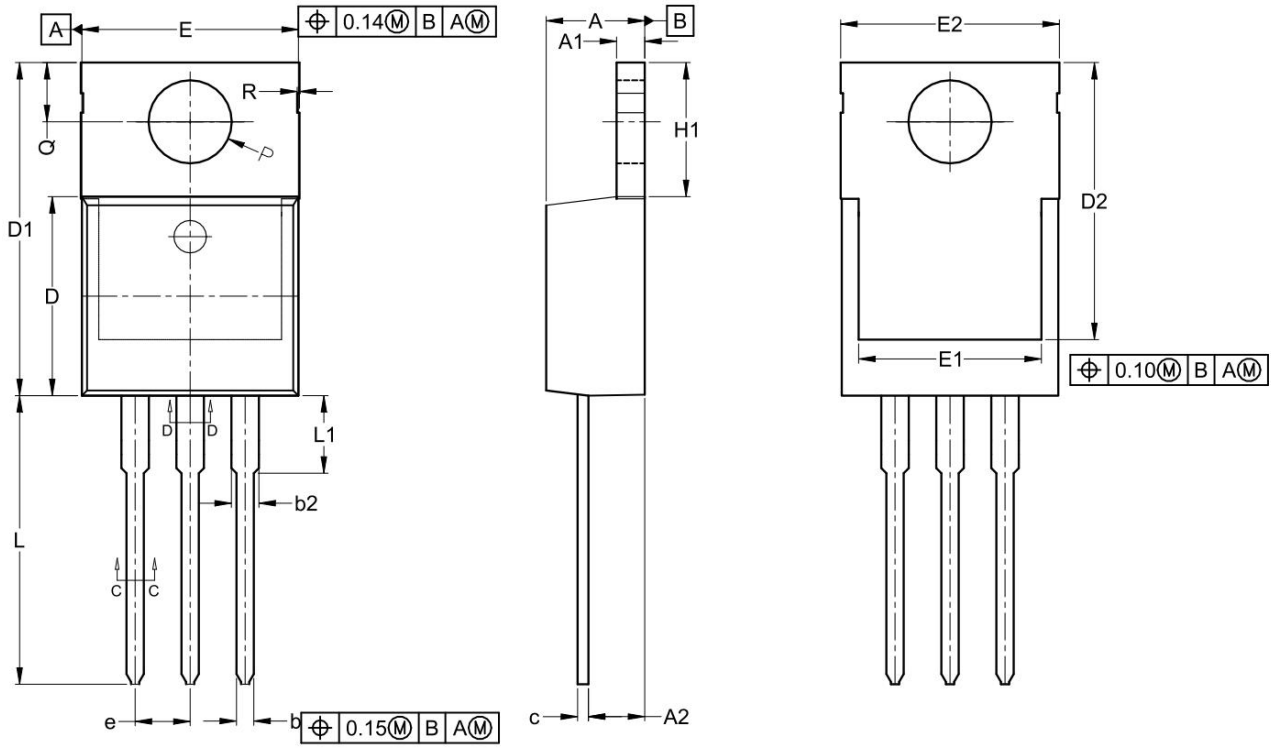


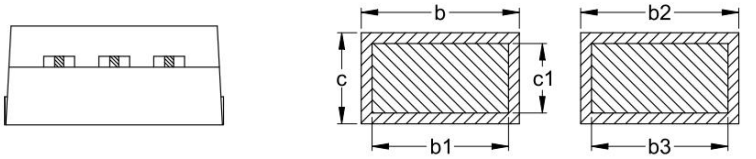
Figure 10. Normalized Maximum Transient Thermal Impedance



TO-220 Package Information



TOP VIEW SIDE VIEW(Right) BOTTOM VIEW



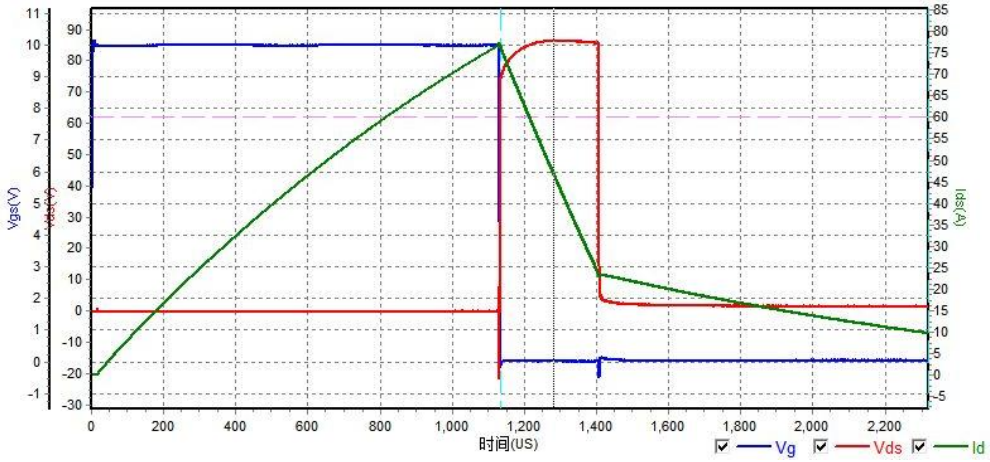
TOP VIEW(Front) SECTION:C-C SECTION:D-D

DIM / SYMBOL	MIN.	NOM.	MAX.	DIM / SYMBOL	MIN.	NOM.	MAX.
A	4.450	4.550	4.650	D2	12.610	12.810	13.010
A1	1.240	1.340	1.440	E	9.900	10.000	10.100
A2	2.500	2.600	2.700	E1	8.240	8.440	8.640
b	0.740	0.840	0.940	E2	9.900	10.100	10.300
b1	0.700	0.800	0.900	e	2.540 BSC.		
b2	1.210	1.310	1.410	H1	6.000	6.200	6.400
b3	1.170	1.270	1.370	L	13.140	13.340	13.540
c	0.440	0.540	0.640	L1	3.385	3.585	3.785
c1	0.400	0.500	0.600	ØP	3.740	3.840	3.940
D	9.100	9.200	9.300	Q	2.600	2.740	2.940
D1	15.200	15.400	15.600	R	0.108 REF.		

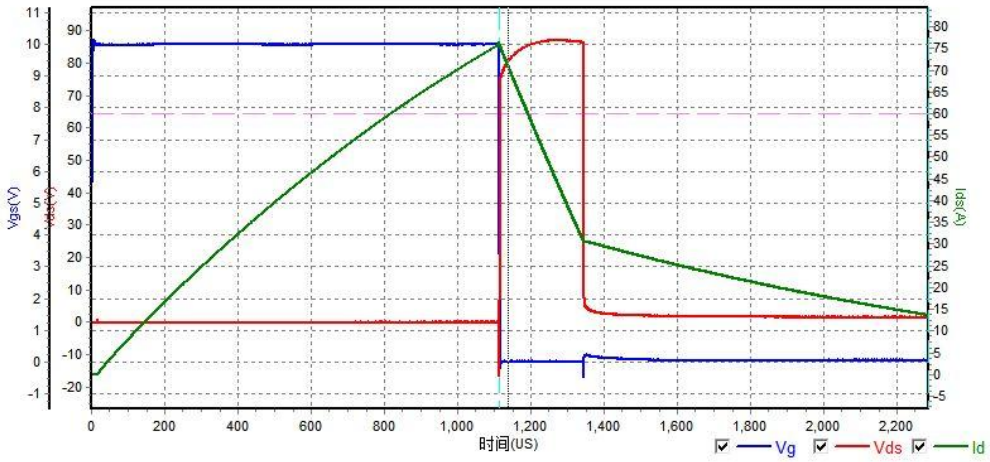
Avalanche Current Graph

RPTI Condition:L=0.500mH,Vd=50.00V,Vg=10.00V,Vgr=0.00V,rg=25ohm					
	IAS		IAS		IAS
#1	73.453A	#2	72.251A	#3	71.756A
	74.007A		73.539A		73.049A
	74.912A		74.134A		74.54A
	76.153A		75.524A		75.182A
	FAIL		FAIL		FAIL

#1



#2



#3

