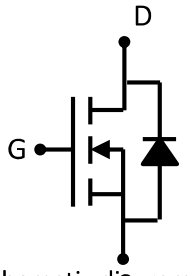
APG078N07

N-Channel Shielding-Gate Mosfet

DATA SHEET

Feature

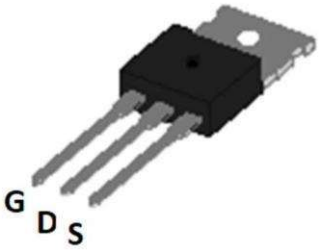
- 70V,100A
  $R_{DS(ON)}$ <7.8mΩ@V_{GS}=10V TYP:6.7 mΩ
- Advanced Trench Power MOSFET
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Schematic diagram

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch
- Rectifier



TO-220C

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G078N07	APG078N07	TO-220C		-	1000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	70	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	100	A
Continuous Drain Current (T_a =100℃)	I_D	70	A
Pulsed Drain Currenr (1)	I_{DM}	305	A
Singel Pulsed Avalanche Energy (2)	E_{AS}	160	mJ
Power Dissipation	P_D	93	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.33	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

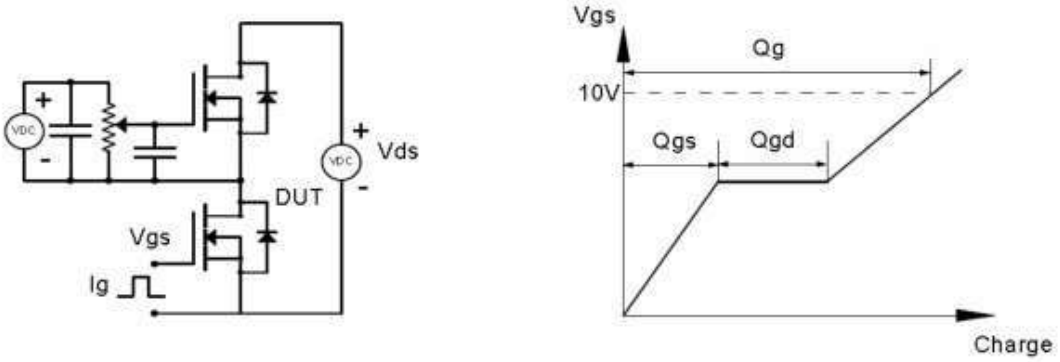
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	70	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =68V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	3	4	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	6.7	7.8	mΩ
Forward tranconductance(3)	g_{FS}	V_{DS} =10V, I_D =30A	-	60	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} =0V, f =1MHz	-	1466	-	pF
Output Capacitance	C_{oss}		-	770	-	
Reverse Transfer Capacitance	C_{rss}		-	55	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DS}=15V, I_D=3A, V_{GS}=10V, R_G=6Ω	-	8.4	-	ns
Turn-on rise time	t_r		-	9.0	-	
Turn-off delay time	$t_{d(off)}$		-	23.6	-	
Turn-off fall time	t_f		-	18	-	
Total Gate Charge	Qg	VDS=50V, ID=12A, VGS=10V	-	28	-	nC
Gate-Source Charge	Qgs		-	5.2	-	
Gate-Drain Charge	Qgd		-	6	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=30A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	100	A

Notes:

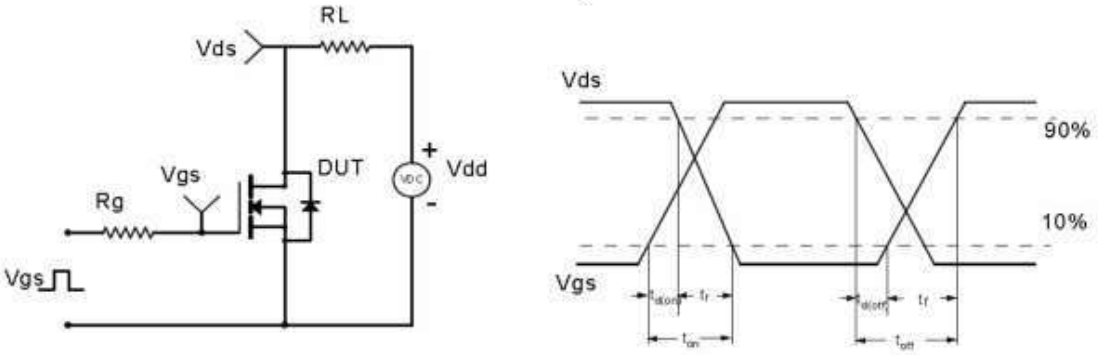
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=10V,R_G=20Ω,L=0.5mH,I_{AS}=25A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit & Waveform

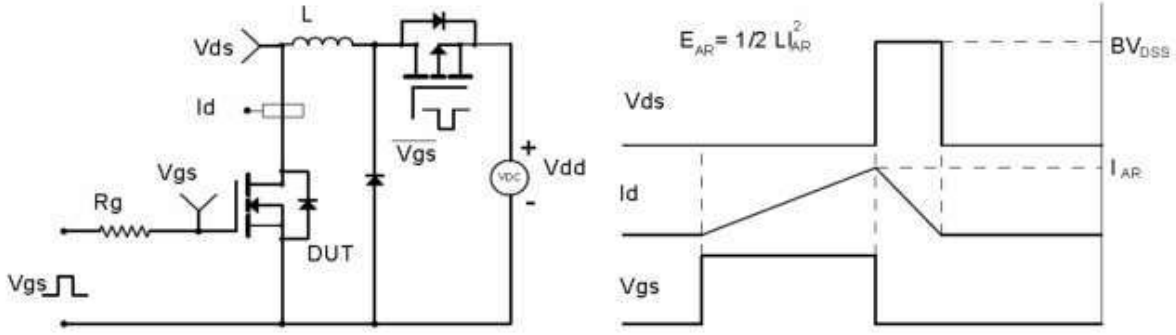
Gate Charge Test Circuit & Waveform



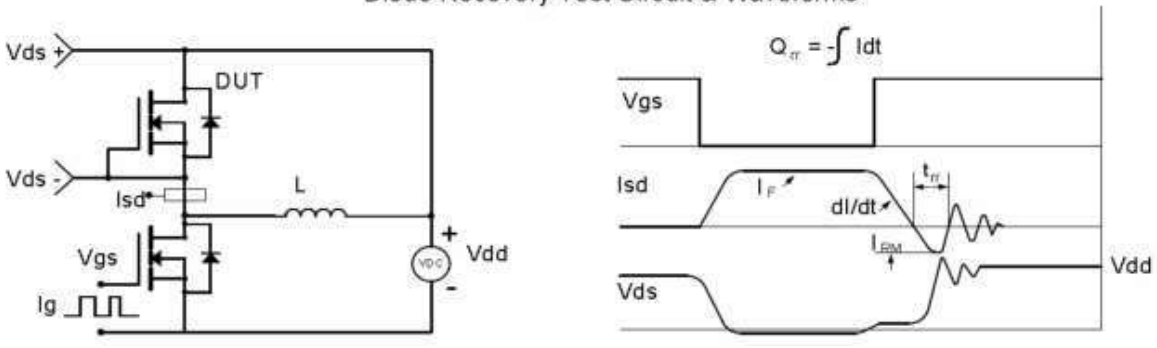
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electronic and Thermal Characteristics

Typical Performance Characteristics

Fig.1 Power Dissipation Derating Curve

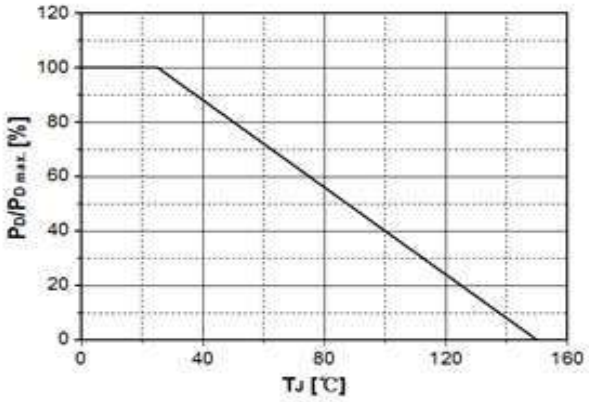


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

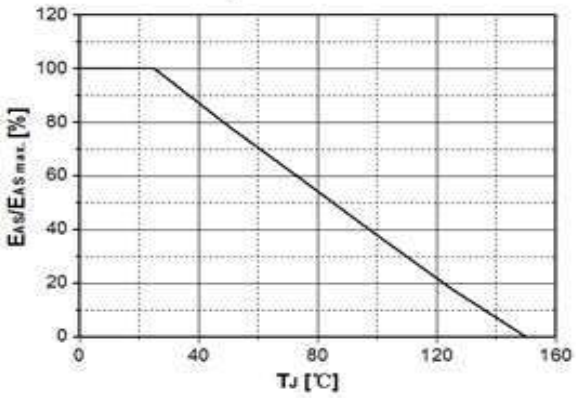


Fig.3 Typical Output Characteristics

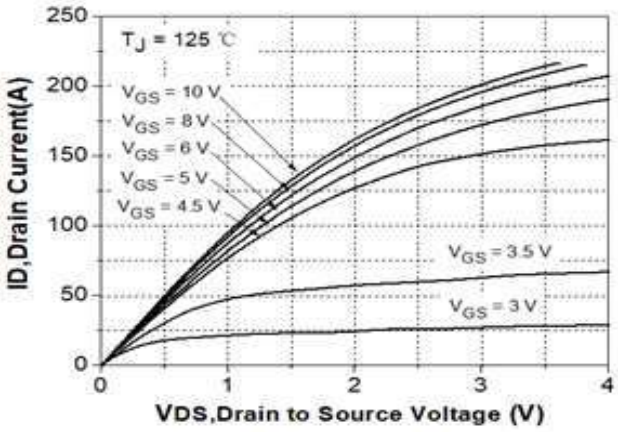


Fig. 4 Transconductance vs. Drain Current

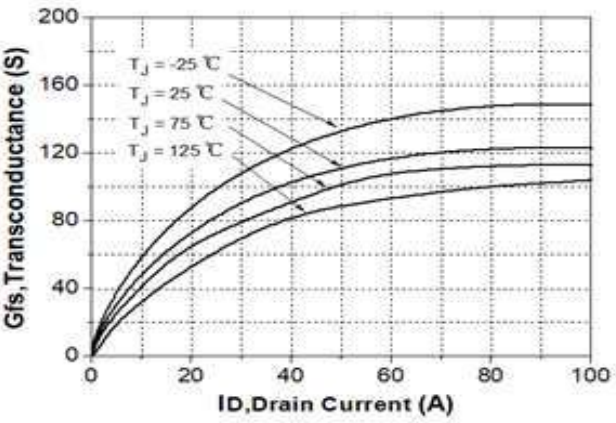


Fig.5 Typical Transfer Characteristics

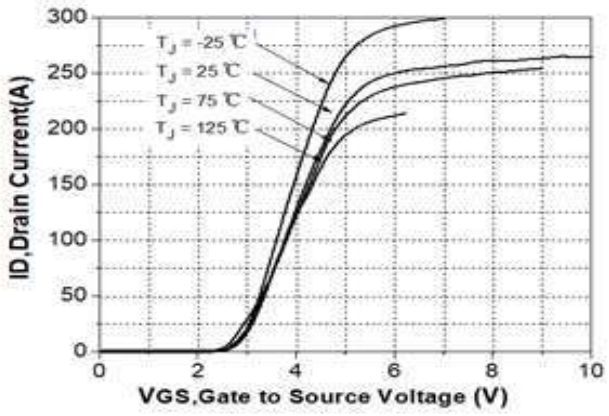


Fig. 6 State Resistance vs. Drain Current @-25℃

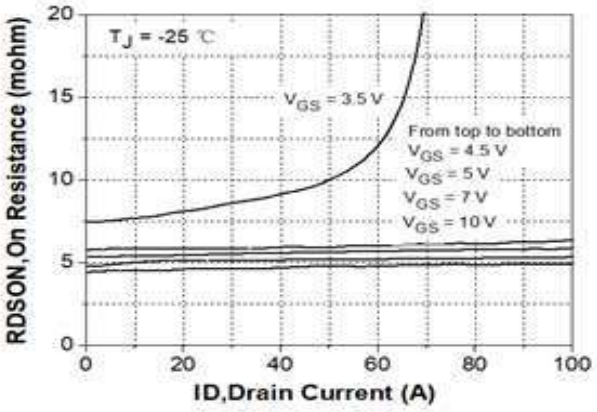


Fig.7 State Resistance vs. Drain Current @25℃

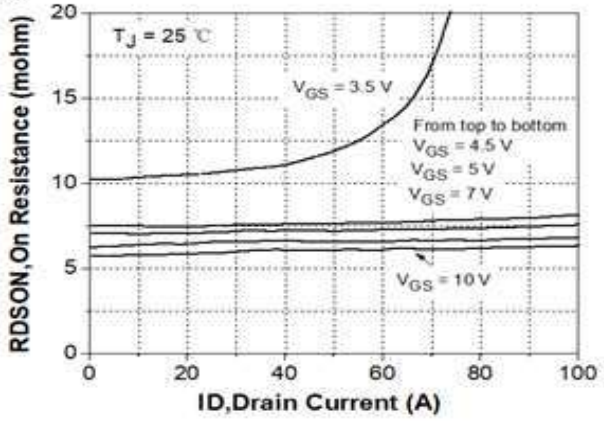


Fig. 8 State Resistance vs. Drain Current @125℃

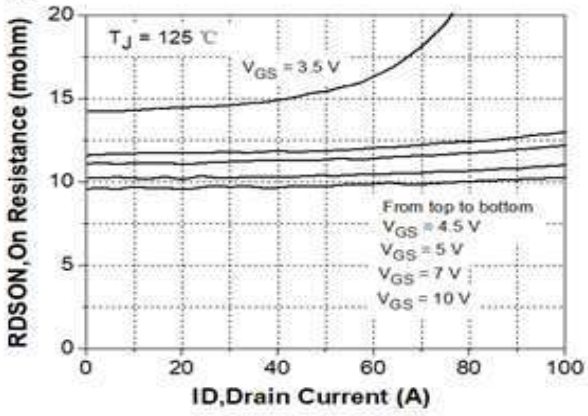


Fig.9 Typical Capacitance vs. Drain Source Voltage

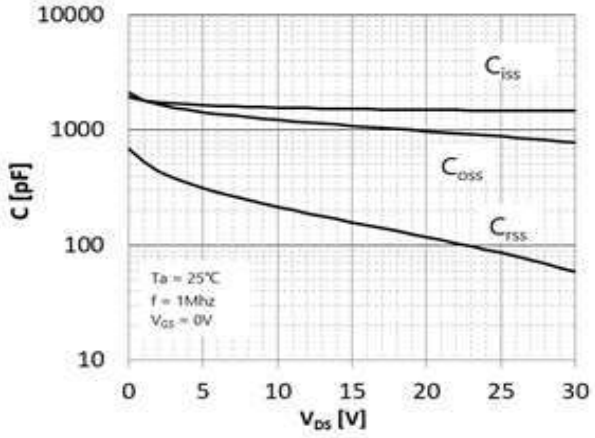


Fig.10 Dynamic Input Characteristics

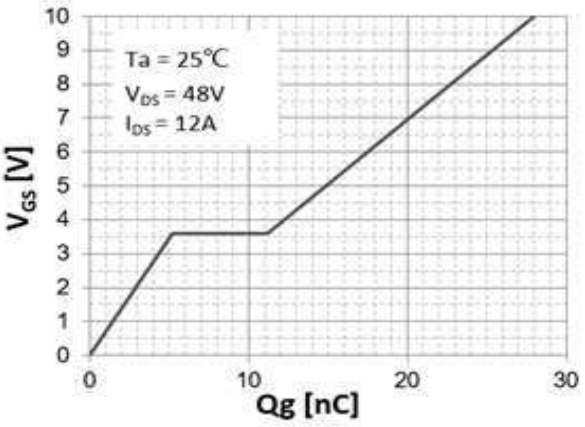


Fig.11 Breakdown Voltage vs. Junction Temperature

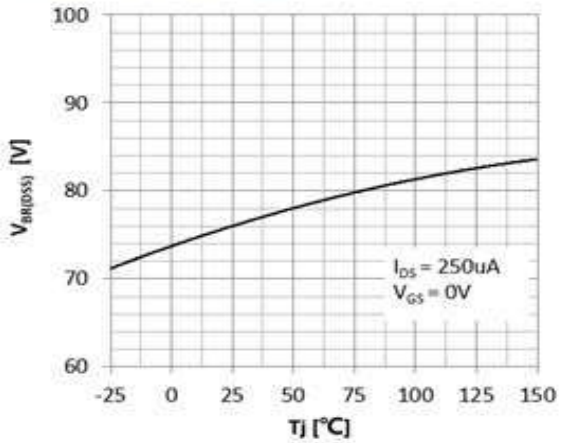


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

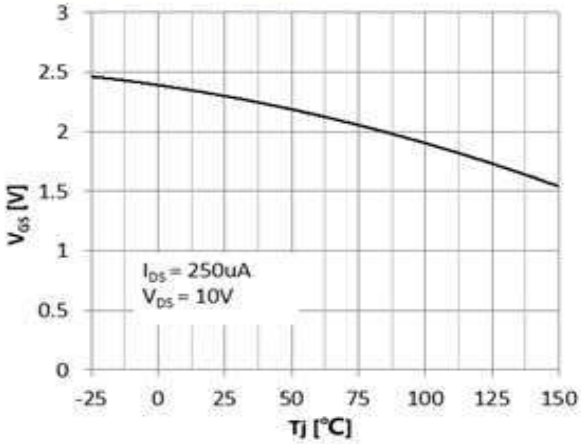


Fig.13 Safe Operating Area

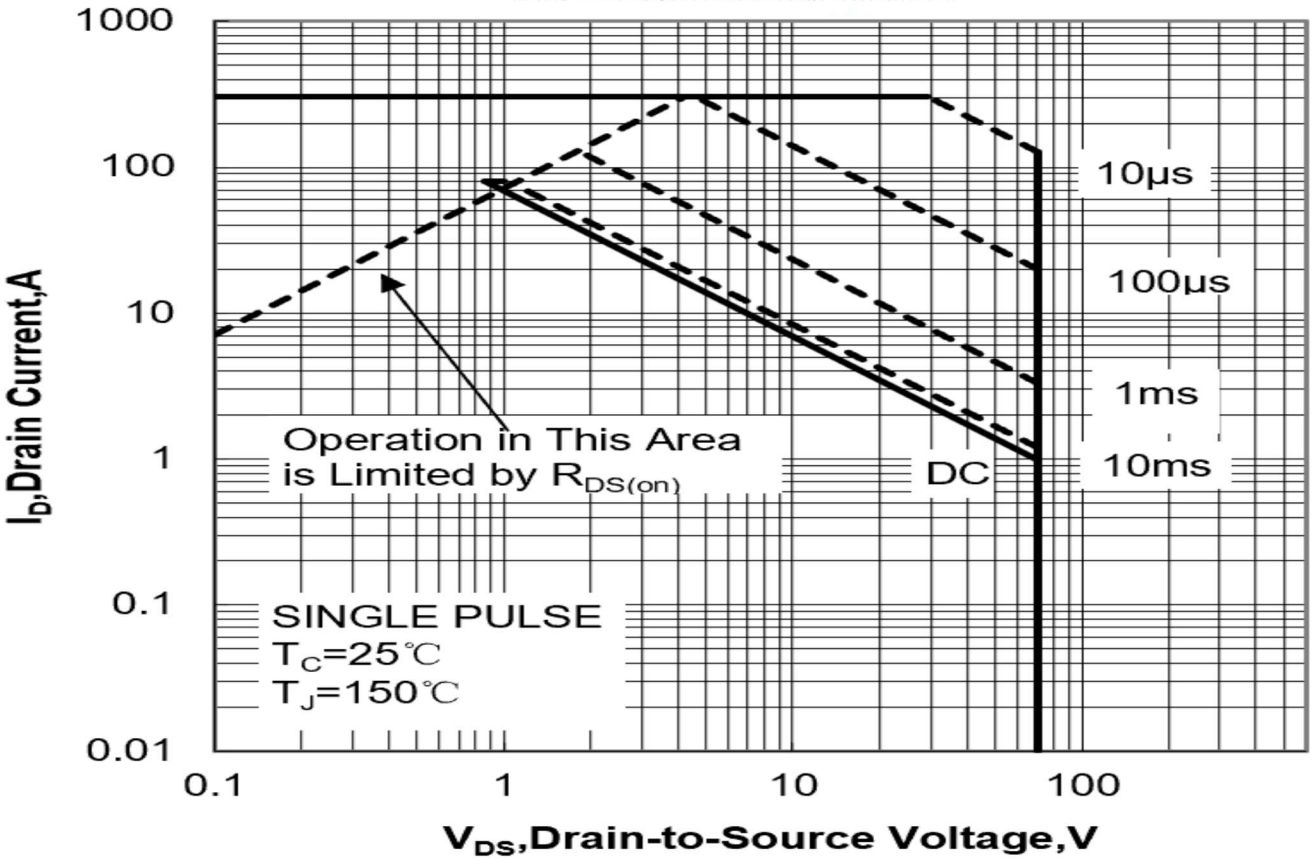
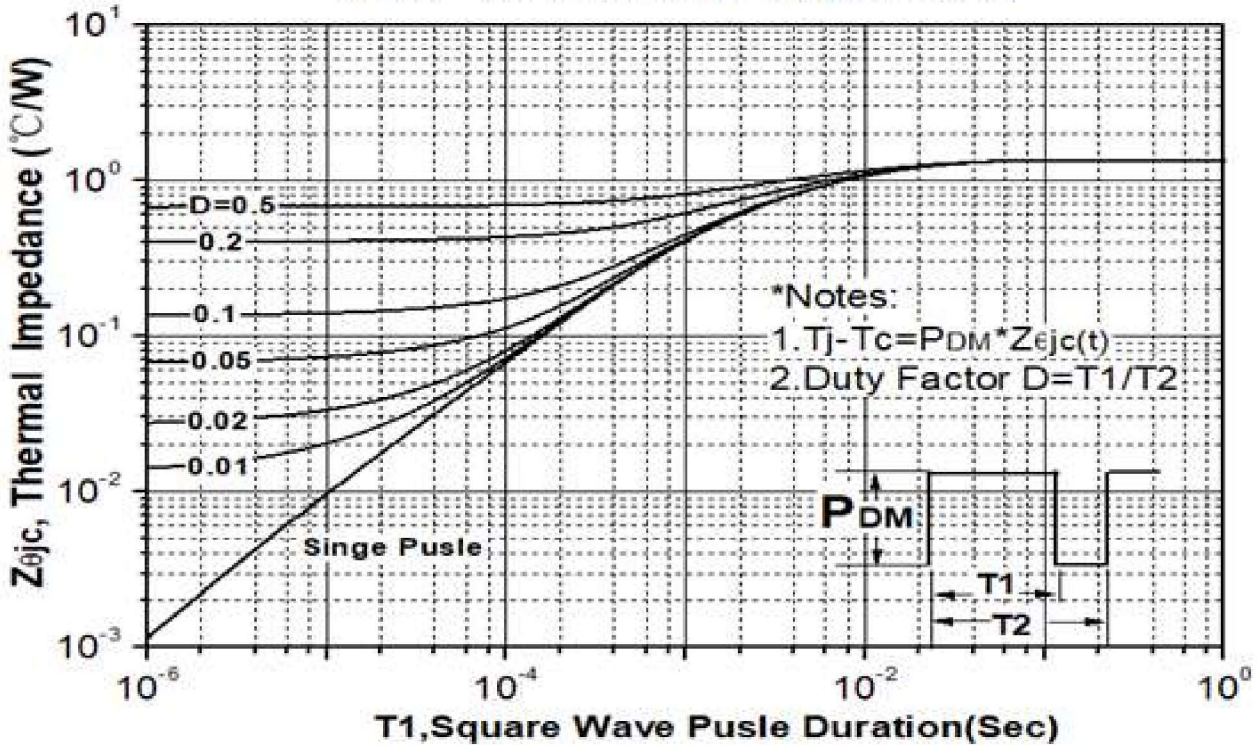
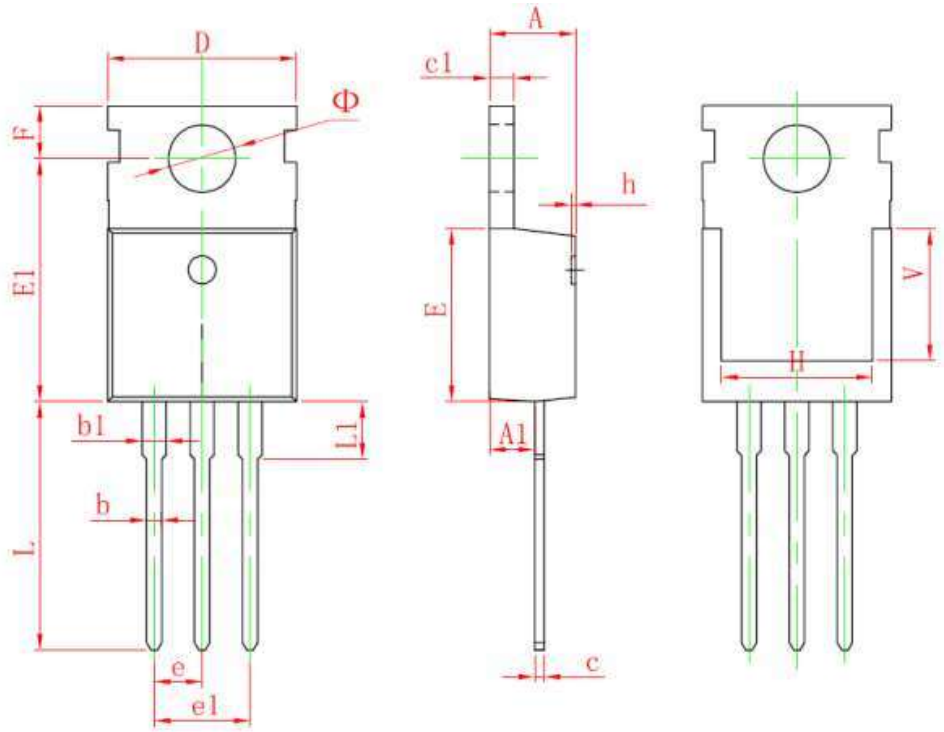


Fig. 14 Transient Thermal Response Curve



TO220C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150