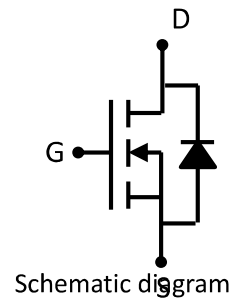


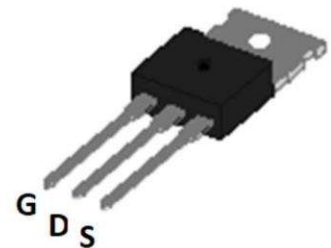
## Feature

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



## 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 ( $T_a=25^{\circ}C$ unless otherwise noted)

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

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

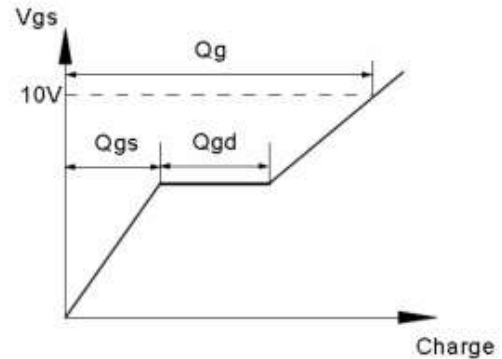
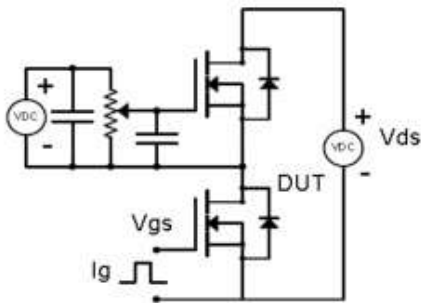
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	70	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =68V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(3)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	6.7	7.8	mΩ
Forward tranconductance <sup>(3)</sup>	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =30A	-	60	-	S
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f =1MHz	-	1466	-	pF
Output Capacitance	C <sub>oss</sub>		-	770	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	55	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =3A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω	-	8.4	-	ns
Turn-on rise time	t <sub>r</sub>		-	9.0	-	
Turn-off delay time	t <sub>d(off)</sub>		-	23.6	-	
Turn-off fall time	t <sub>f</sub>		-	18	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =12A, V <sub>GS</sub> =10V	-	28	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	5.2	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	6	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	V <sub>DS</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	I <sub>S</sub>		-	-	100	A

**Notes:**

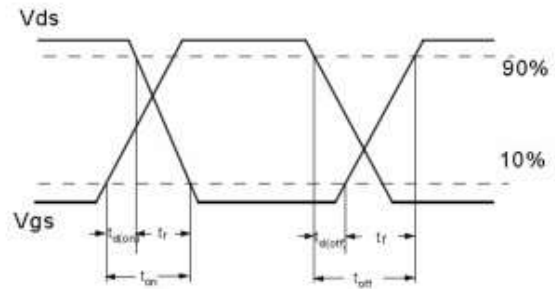
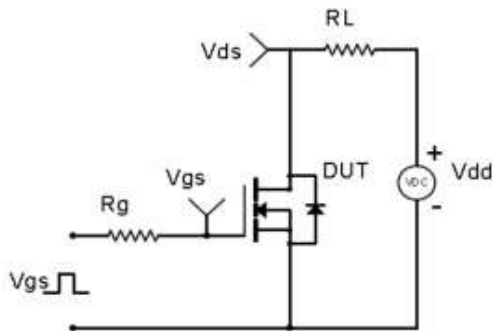
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T<sub>J</sub>=25°C, V<sub>DD</sub>=10V, R<sub>G</sub>=20 Ω ,L=0.5mH, I<sub>AS</sub>=25A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

**Test Circuit & Waveform**

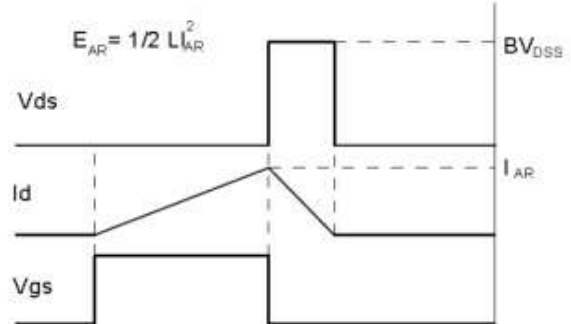
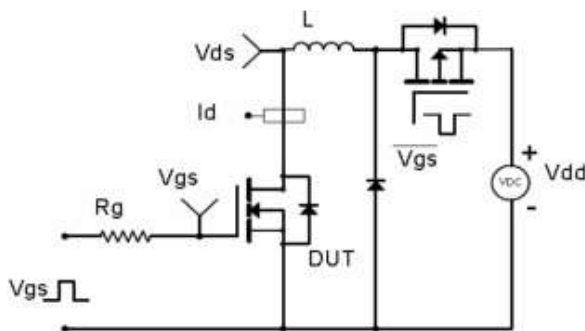
Gate Charge Test Circuit & Waveform



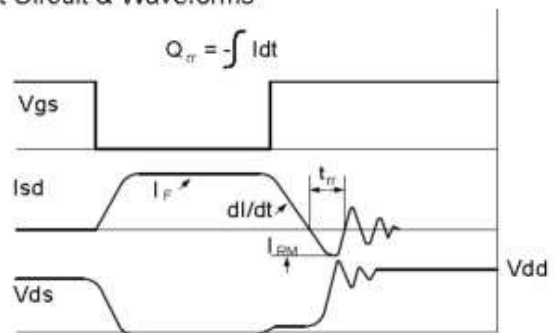
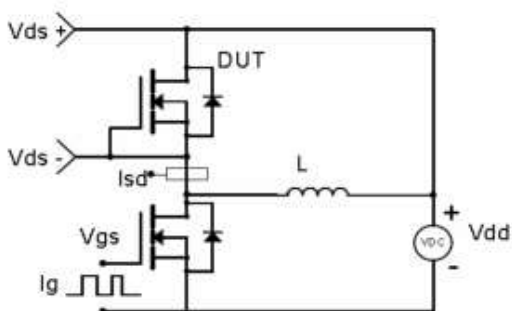
Resistive Switching Test Circuit & Waveforms



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

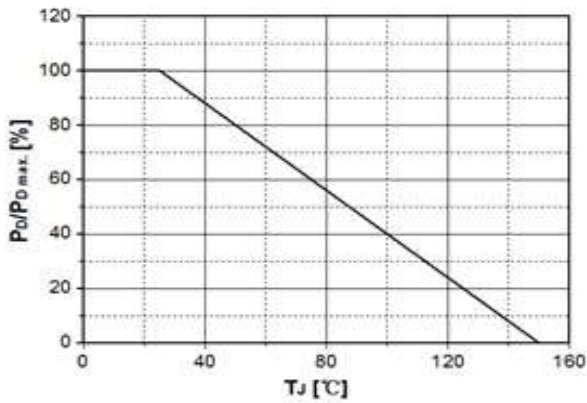


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

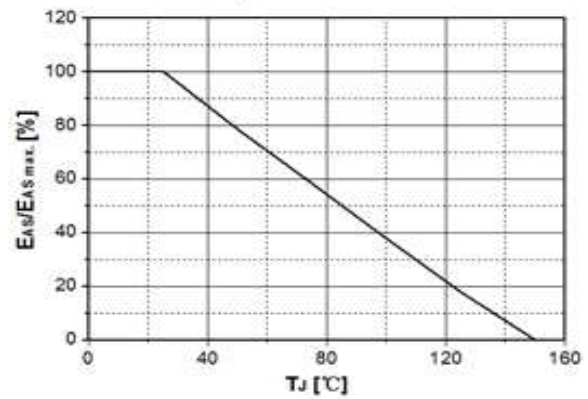


Fig.3 Typical Output Characteristics

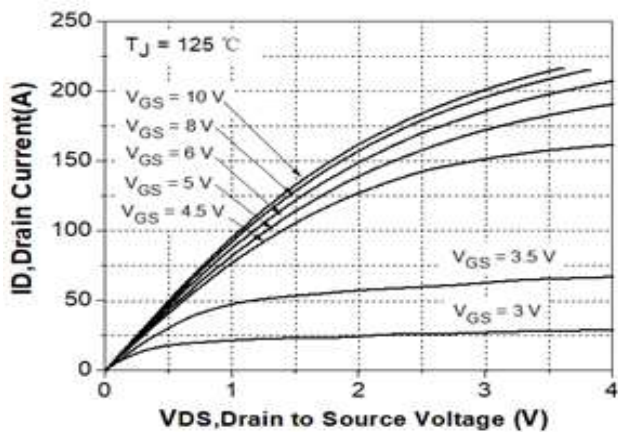


Fig. 4 Transconductance vs. Drain Current

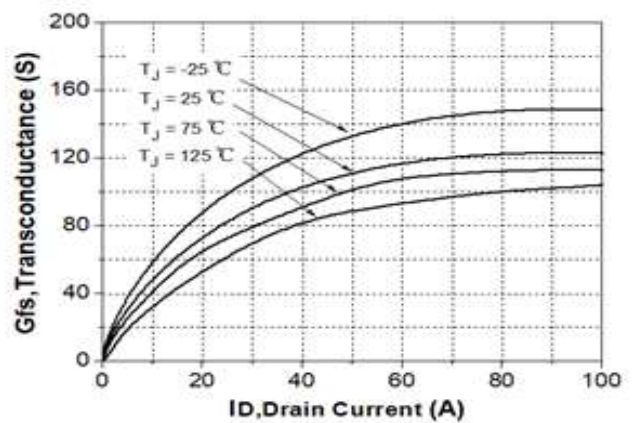


Fig.5 Typical Transfer Characteristics

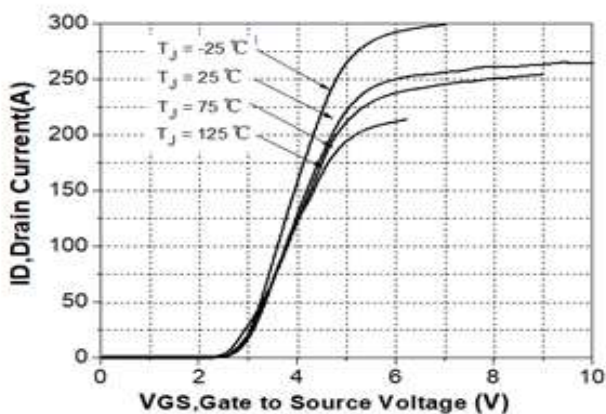


Fig. 6 State Resistance vs. Drain Current @ -25°C

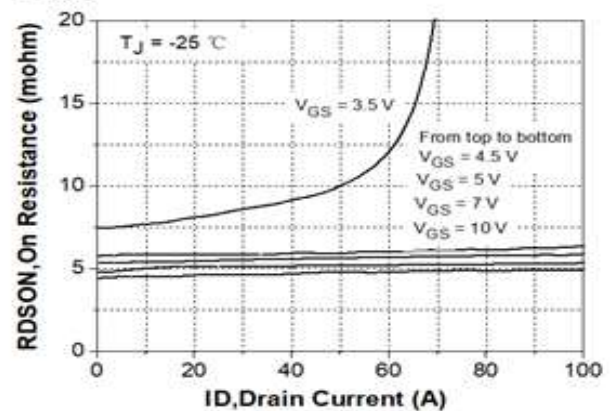


Fig.7 State Resistance vs. Drain Current @25°C

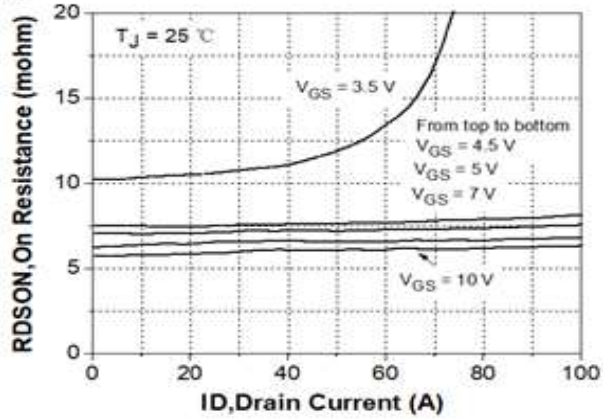


Fig. 8 State Resistance vs. Drain Current @125°C

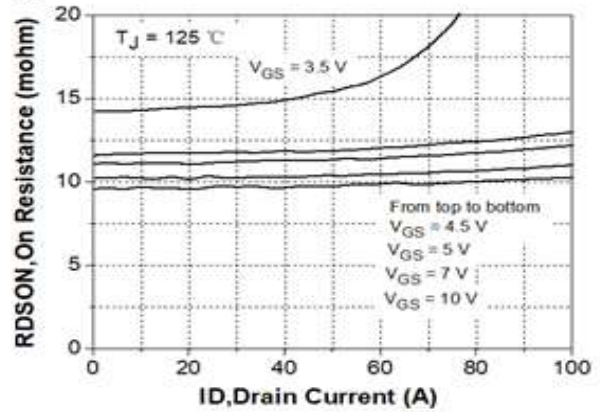


Fig.9 Typical Capacitance vs. Drain Source Voltage

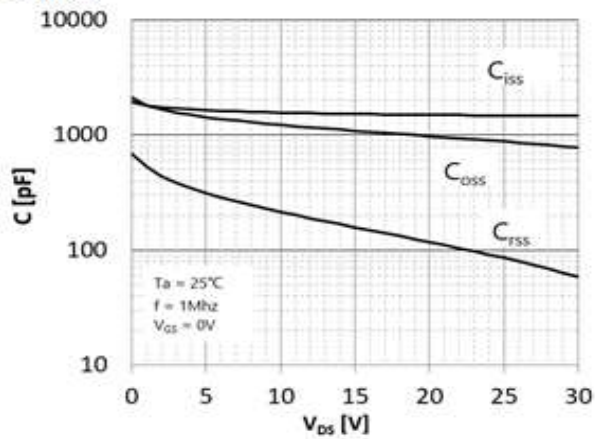


Fig.10 Dynamic Input Characteristics

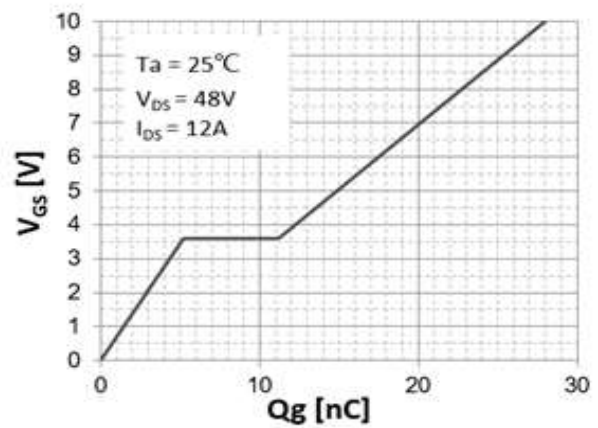


Fig.11 Breakdown Voltage vs. Junction Temperature

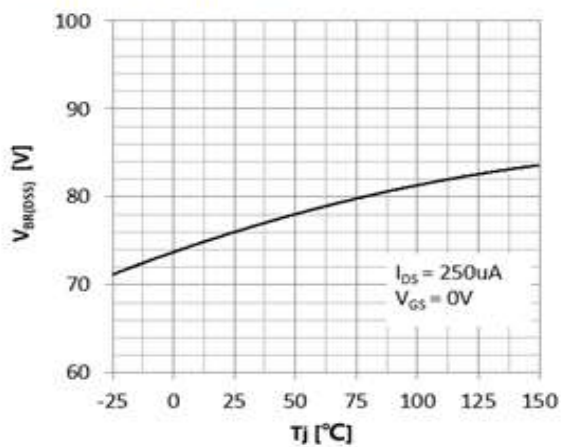


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

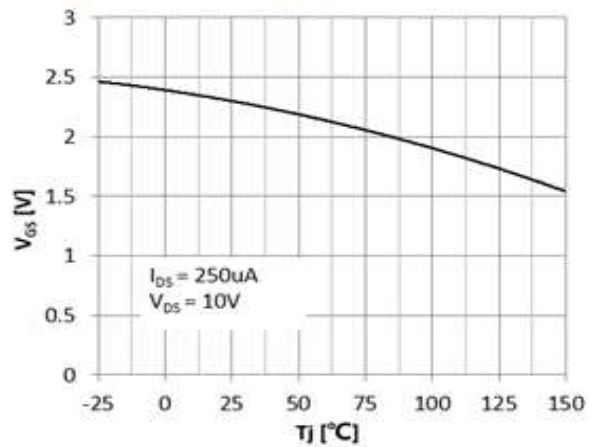


Fig.13 Safe Operating Area

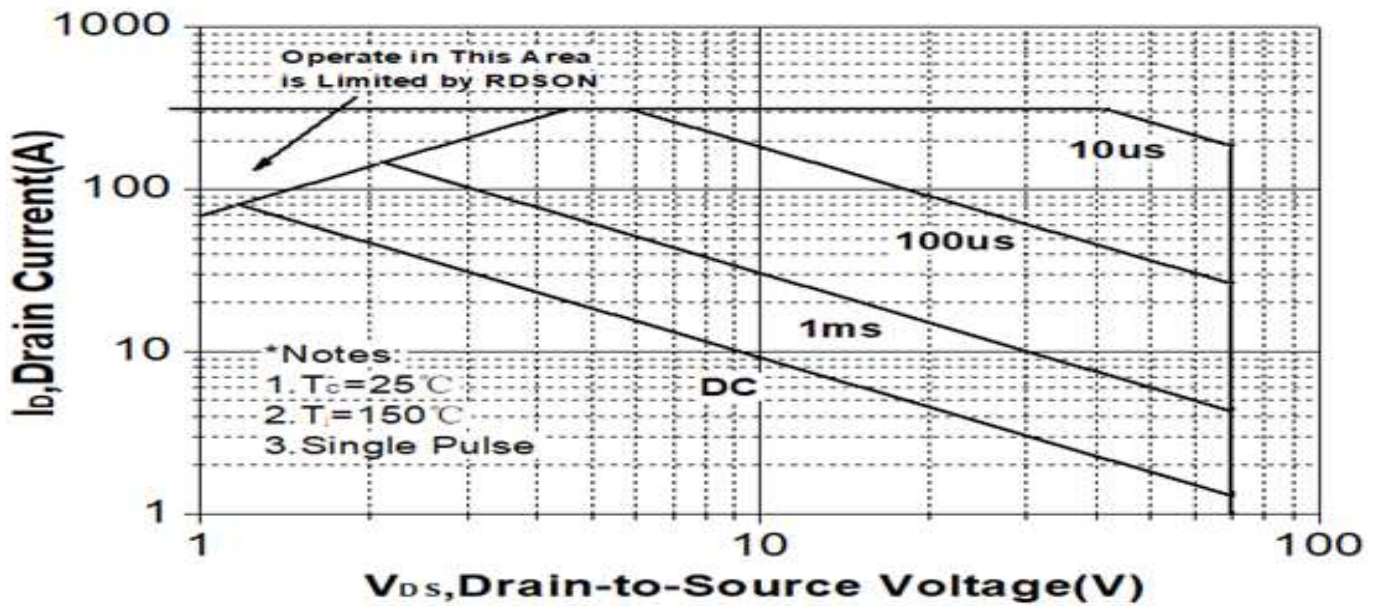
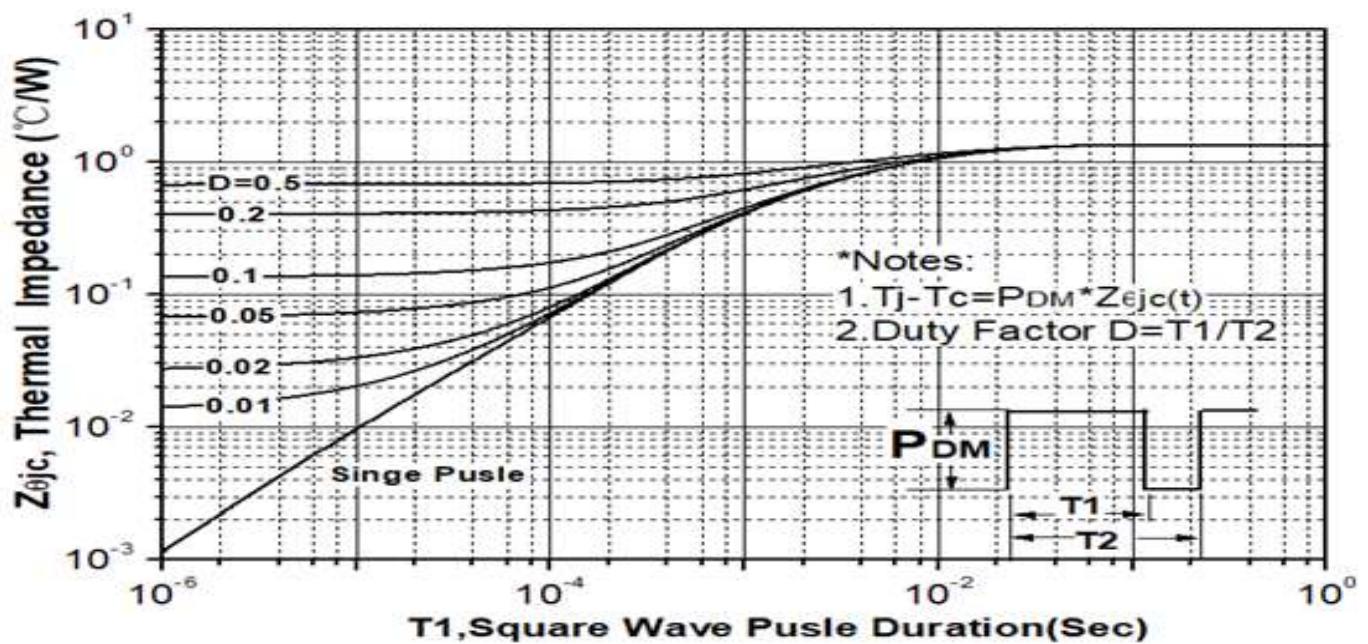


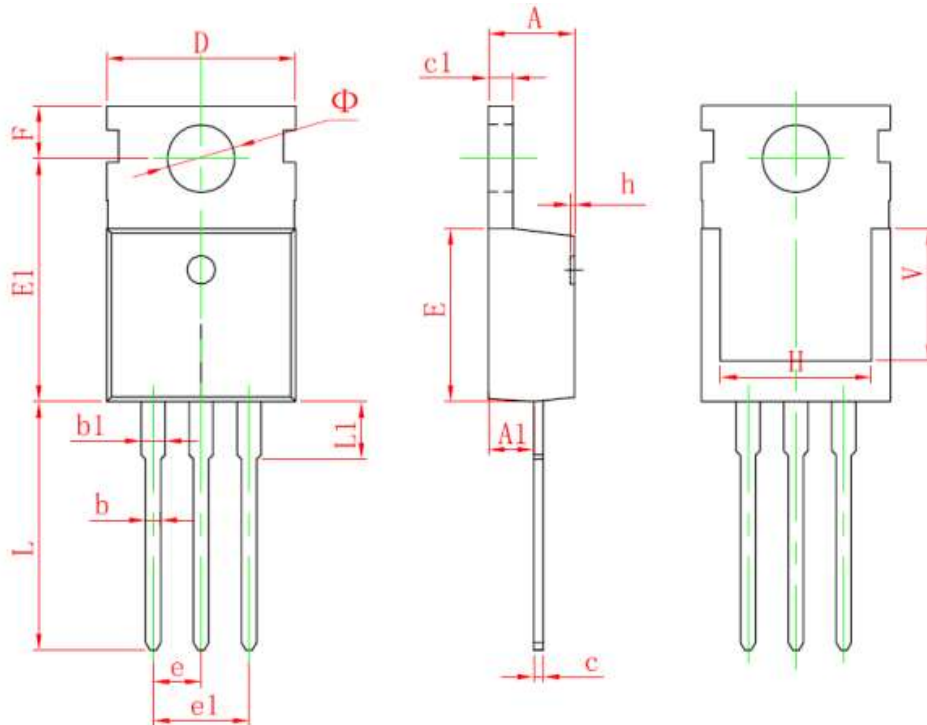
Fig. 14 Transient Thermal Response Curve



# APG078N07

N-Channel Shielding-Gate Mosfet

### 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