



UNI-SEMICONDUCTOR CO., LTD

宇力半导体有限公司



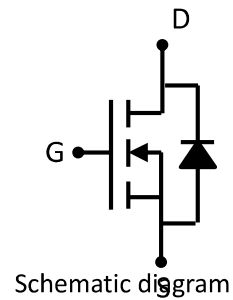
APG078N07 Data Sheet

V 1.1

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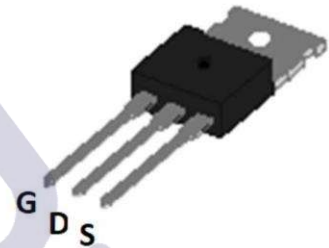
Feature

- 70V,100A
 $R_{DS(ON)} < 7.8m\Omega @ V_{GS}=10V$ TYP:6.7 m Ω
- 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 ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	70	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a=25^\circ\text{C}$)	I_D	100	A
Continuous Drain Current ($T_a=100^\circ\text{C}$)	I_D	70	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	305	A
Single 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	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

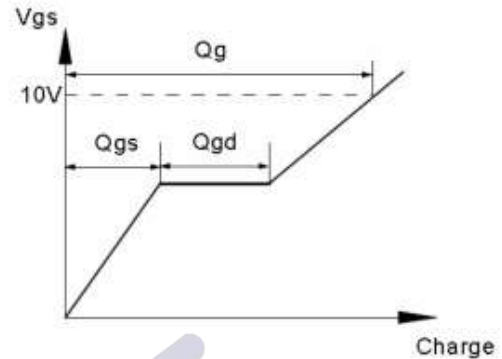
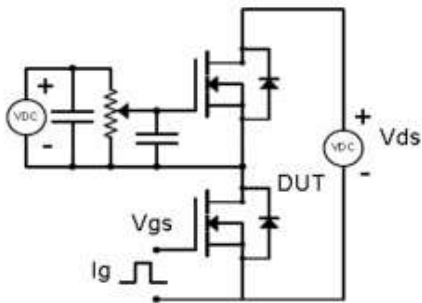
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	70	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 68V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±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	Q _g	V _{DS} = 50V, I _D = 12A, V _{GS} = 10V	-	28	-	nC
Gate-Source Charge	Q _{gs}		-	5.2	-	
Gate-Drain Charge	Q _{gd}		-	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:

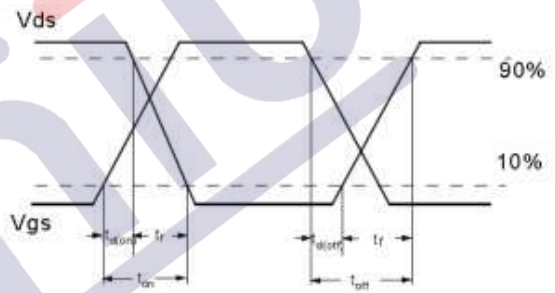
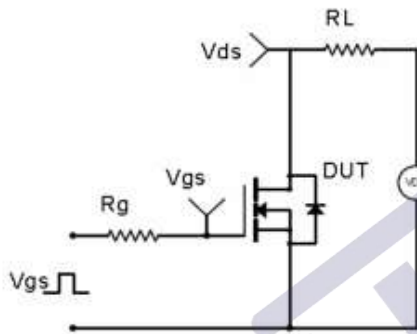
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T_J = 25°C, V_{DD} = 10V, R_G = 20 Ω, L = 0.5mH, I_{AS} = 25A
3. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Surface Mounted on FR4 Board, t ≤ 10 sec

Test Circuit & Waveform

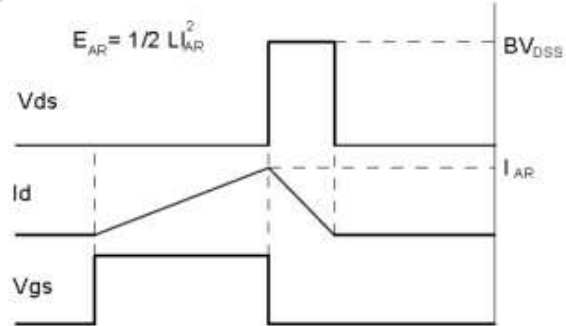
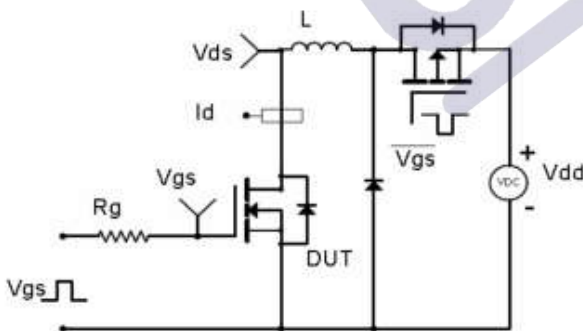
Gate Charge Test Circuit & Waveform



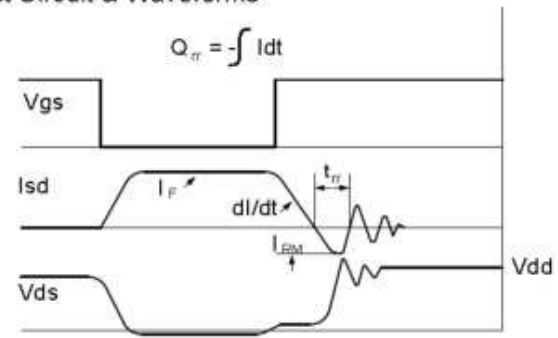
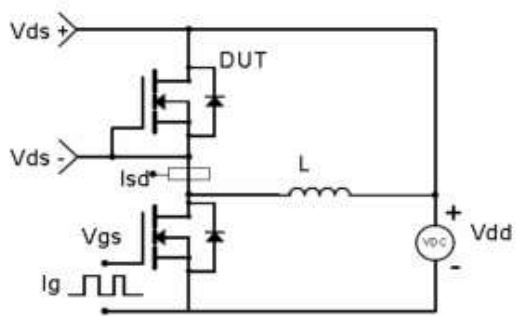
Resistive Switching Test Circuit & Waveforms



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

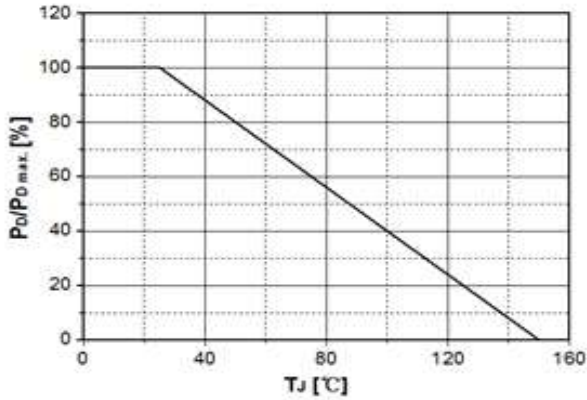


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

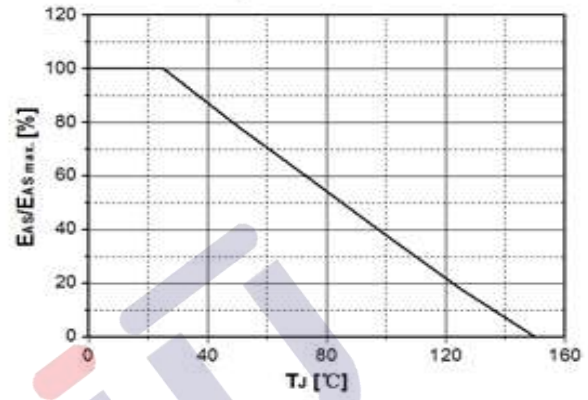


Fig.3 Typical Output Characteristics

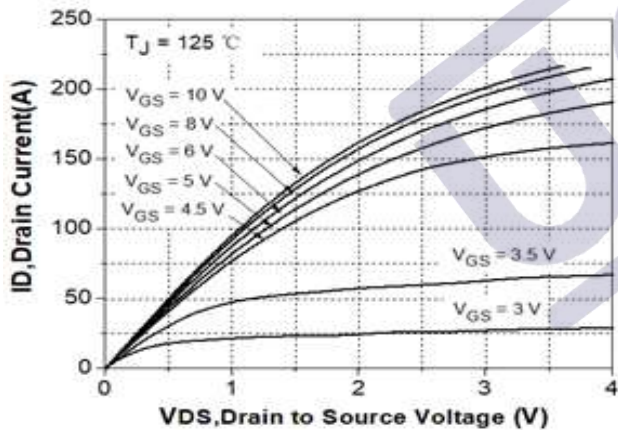


Fig.4 Transconductance vs. Drain Current

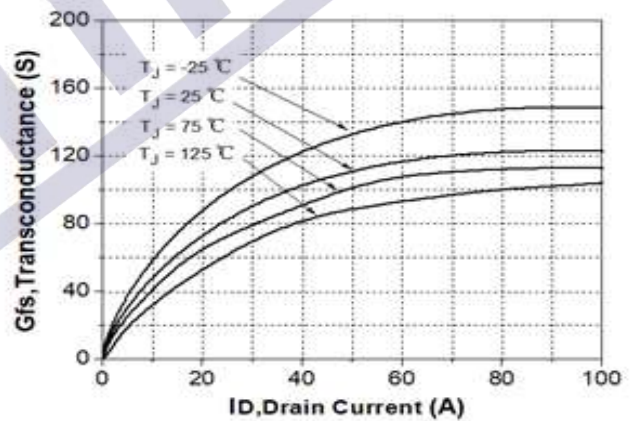


Fig.5 Typical Transfer Characteristics

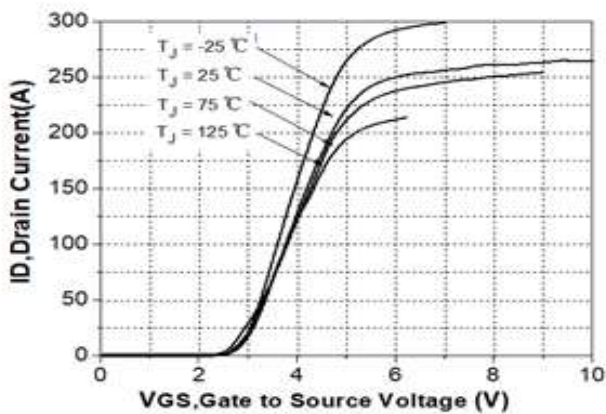


Fig.6 State Resistance vs. Drain Current @-25°C

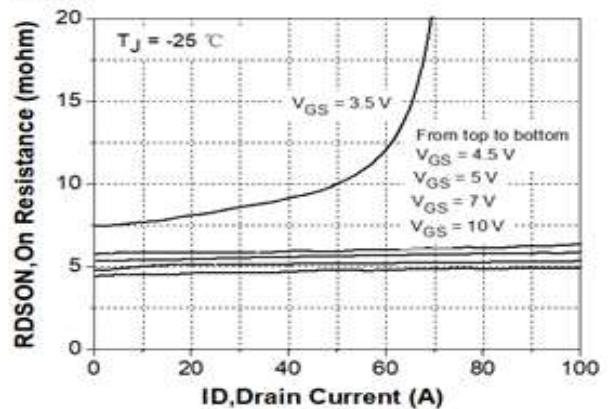


Fig.7 State Resistance vs. Drain Current @25°C

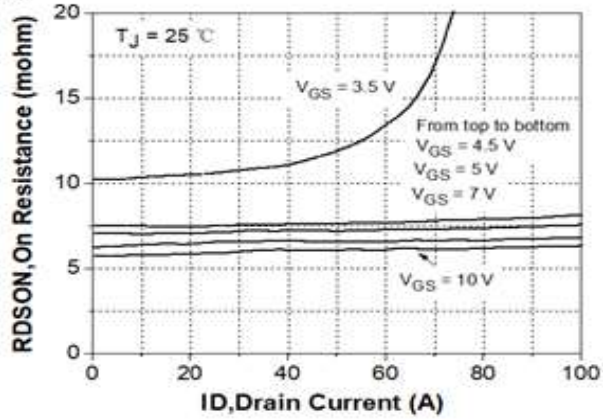


Fig. 8 State Resistance vs. Drain Current @125°C

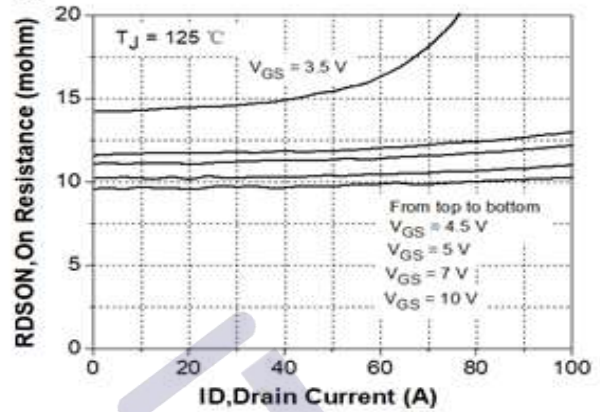


Fig.9 Typical Capacitance vs. Drain Source Voltage

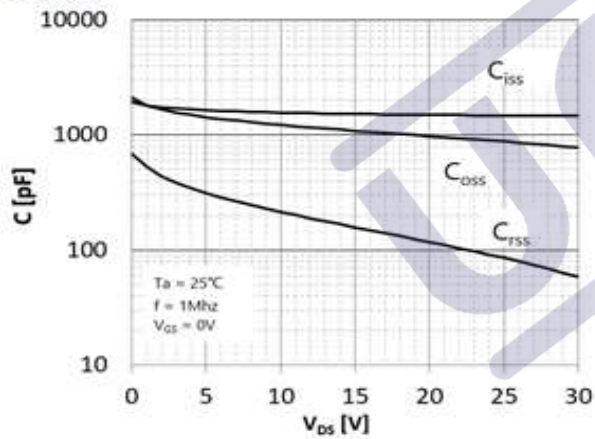


Fig.10 Dynamic Input Characteristics

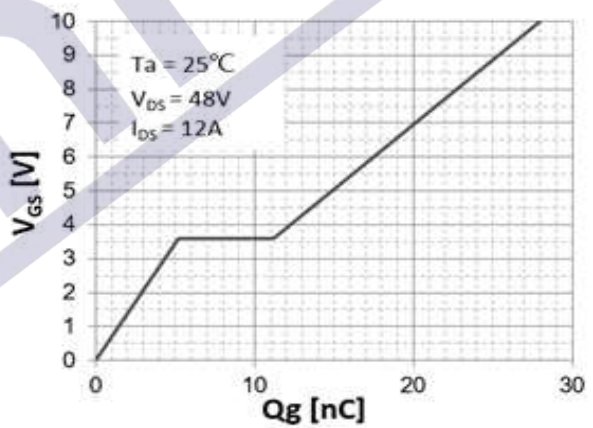


Fig.11 Breakdown Voltage vs. Junction Temperature

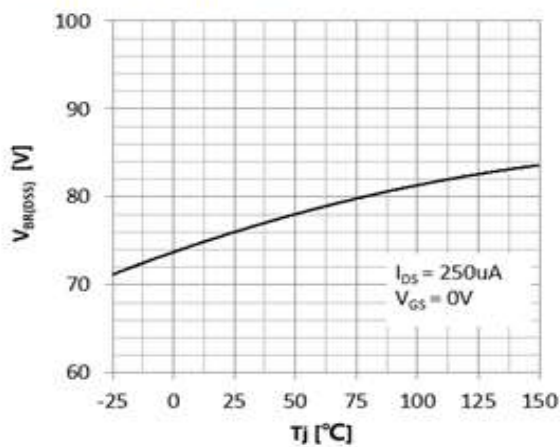


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

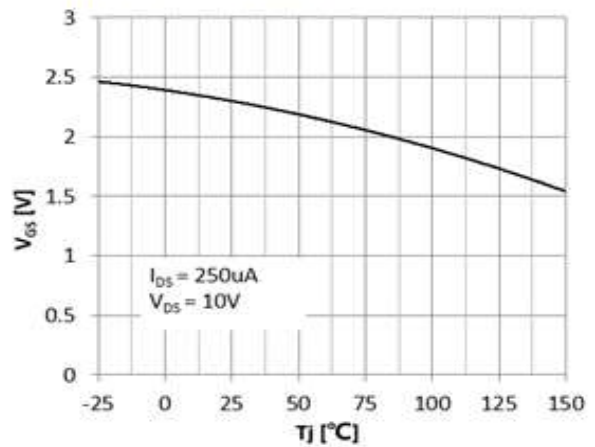


Fig.13 Safe Operating Area

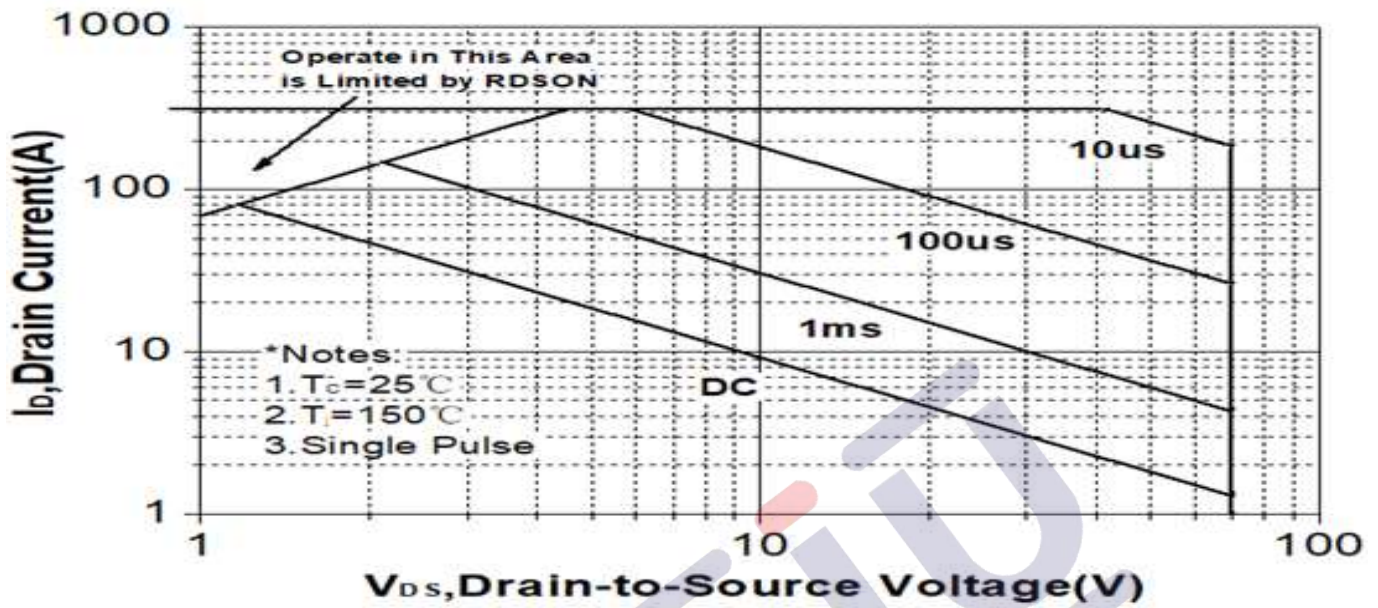
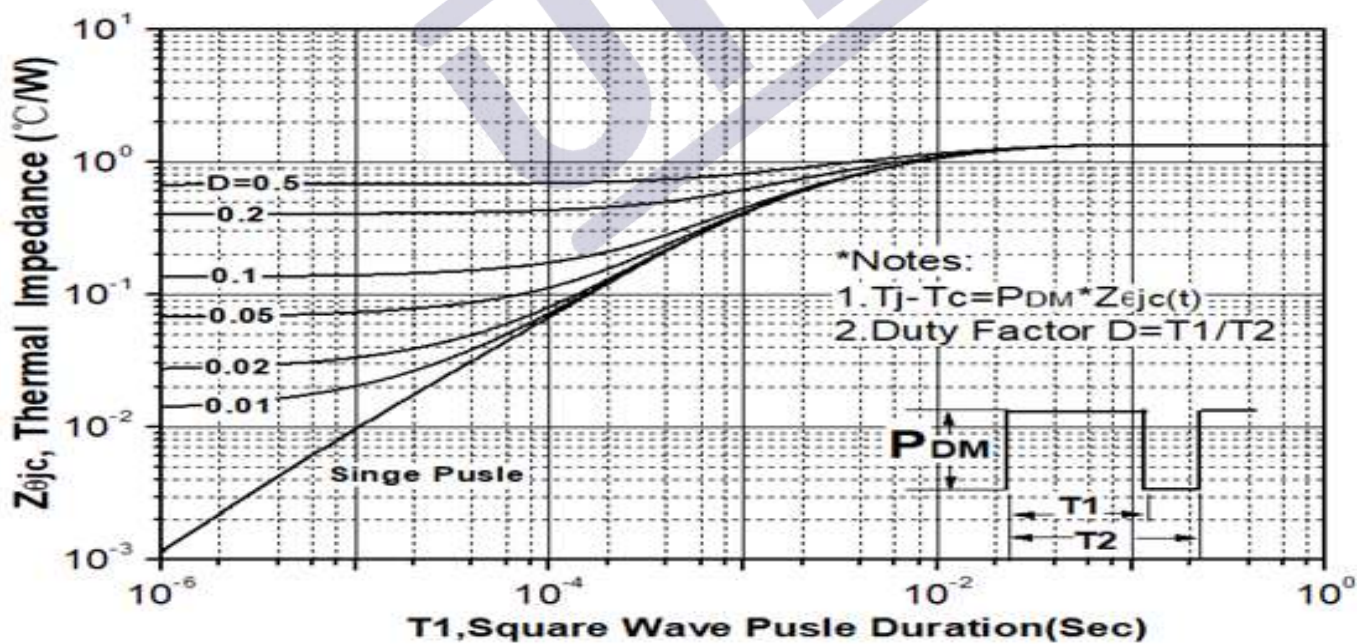
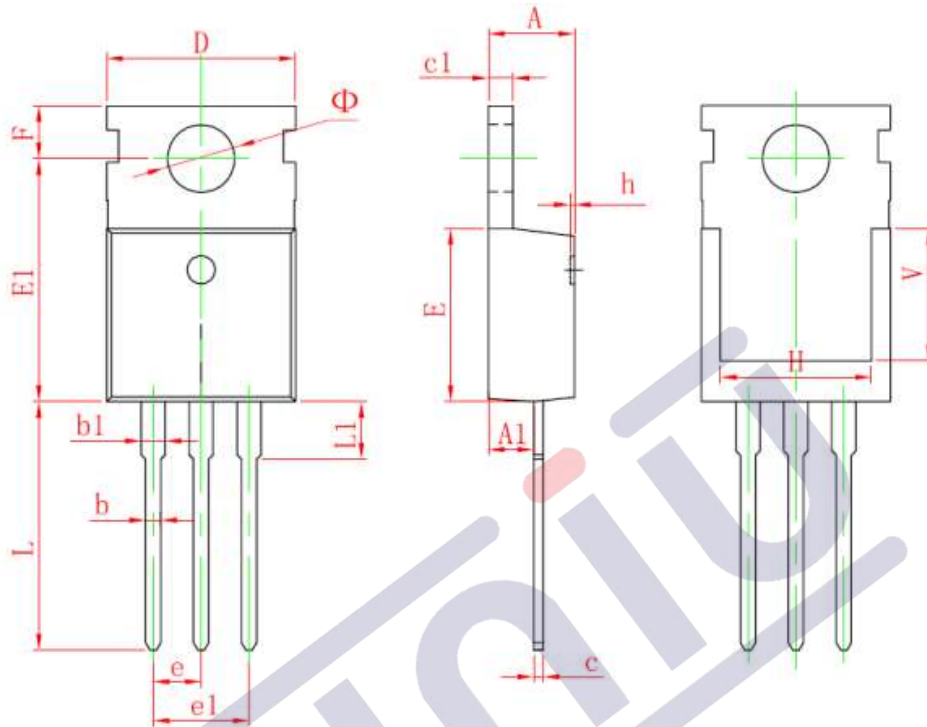


Fig. 14 Transient Thermal Response Curve



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

1.版本记录

DATE	REV.	DESCRIPTION
2018/04/19	1.0	First Release
2021/11/12	1.1	Layout adjustment

2.免责声明

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3.联系我们

浙江宇力微新能源科技有限公司

总部地址：绍兴市越城区斗门街道袍渎路25号中节能科创园45幢4/5楼

电话：0575-85087896（研发部）

传真：0575-88125157

E-mail: htw@uni-semic.com

无锡地址：无锡市锡山区先锋中路6号中国电子（无锡）数字芯城1#综合楼503室

电话：0510-85297939

E-mail: zh@uni-semic.com

深圳地址：深圳市宝安区西乡街道南昌社区宝源路泳辉国际商务大厦410

电话：0755-84510976

E-mail: htw@uni-semic.com