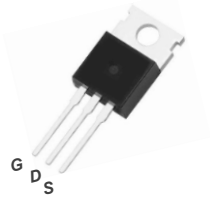
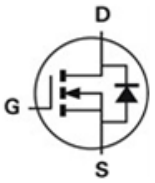
N-Channel Enhancement Mode MOSFET

Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Pin Description

TO-220	Symbol
	

Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	150	V
$R_{DS(ON)-Typ}$	8	mΩ
I_D	90	A

Absolute Maximum Ratings(T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		150	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
E_{AS}	Single Pulse Avalanche Energy③		211	mJ
I_{DM} ①	Pulse Drain Current Tested		220	A
I_D	Continuous Drain Current	T_C=25°C	90	A
P_D	Maximum Power Dissipation	T_C=25°C	179	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case①	2.5	℃/W

Note ①: Max. current is limited by bonding wire.

Note ②: UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③: Surface Mounted on 1in² FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	150	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=150V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	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
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V , I_D=20A	---	8	10	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, Freq.=1MHz	---	8600	---	pF
C_{oss}	Output Capacitance		---	460	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=50V ,I_D=1A, V_{GS}=10V , R_G=6Ω	---	60	---	nS
T_r	Turn-on Rise Time		---	65	---	
$T_{d(off)}$	Turn-off Delay Time		---	190	---	
T_f	Turn-off Fall Time		---	80	---	
Q_g	Total Gate Charge	V_{DS}=100V , V_{GS}=10V , I_D=10A	---	220	---	nC
Q_{gs}	Gate-Source Charge		---	60	---	
Q_{gd}	Gate-Drain Charge		---	40	---	
Source-Drain Characteristics （T_J=25℃）						
I_S	Continuous Source Current$_1$		---	---	90	A
V_{SD}	Diode Forward Voltage$_2$	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.4	V

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

Typical Characteristics

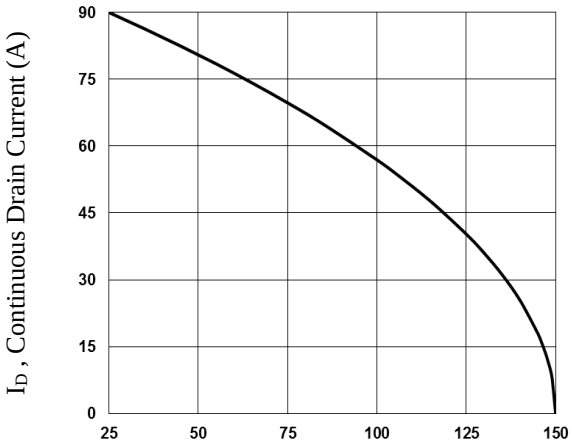

Fig.1 Continuous Drain Current vs. T_C

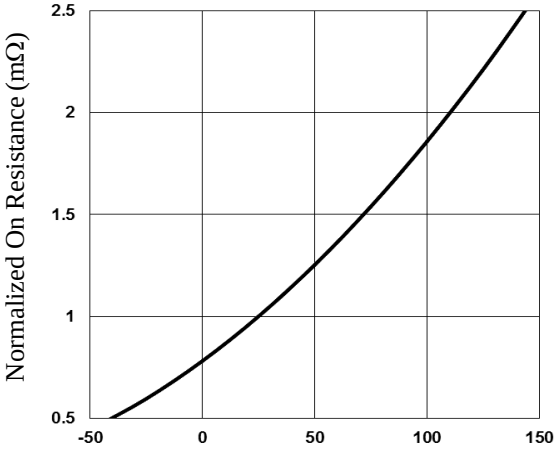

Fig.2 Normalized RDSON vs. T_J

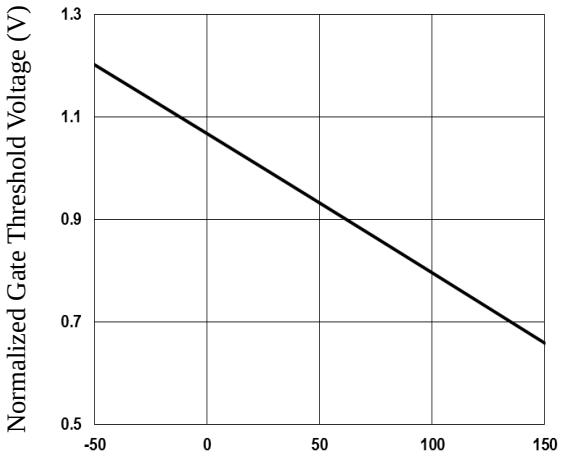

Fig.3 Normalized Vth vs. T_J

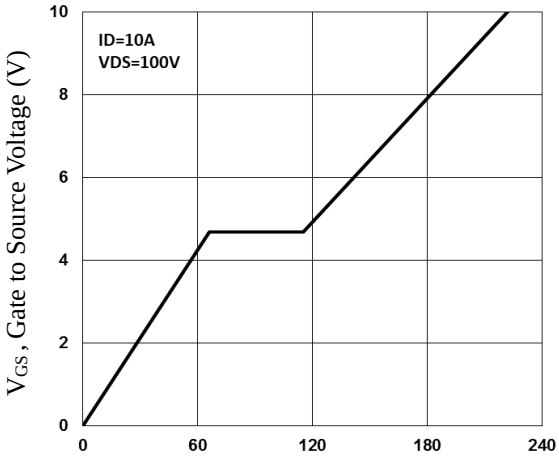

Fig.4 Gate Charge Characteristics

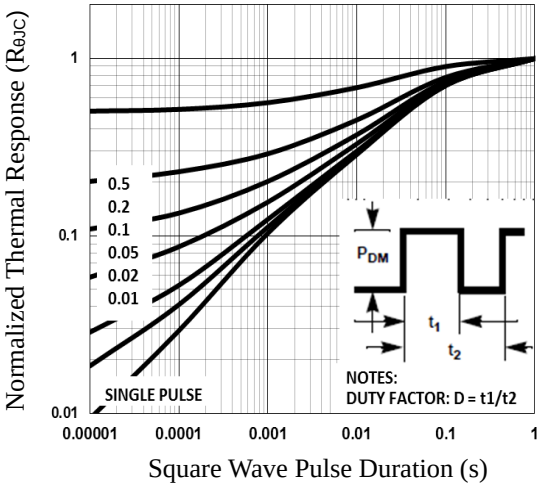

Fig.5 Normalized Transient Impedance

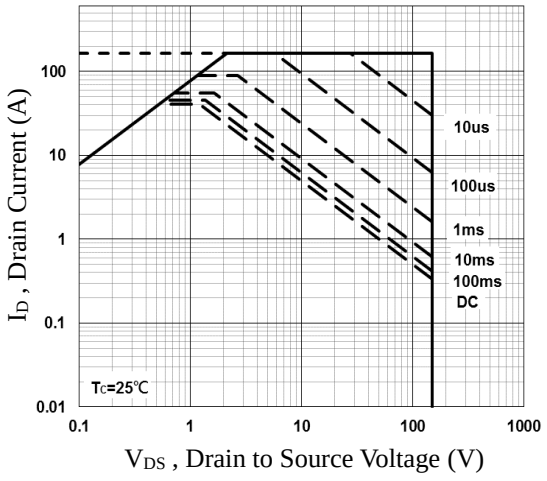

Fig.6 Maximum Safe Operation Area

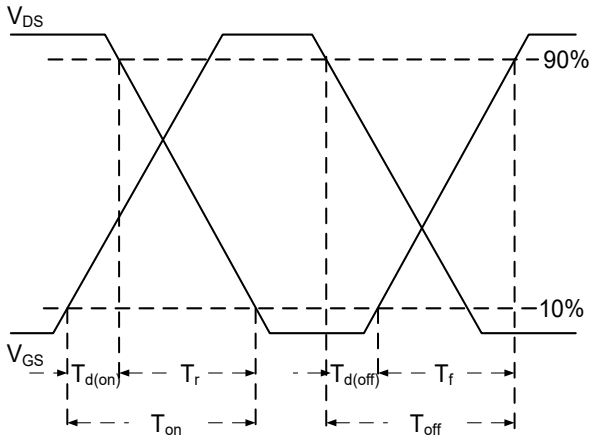

Fig.7 Switching Time Waveform

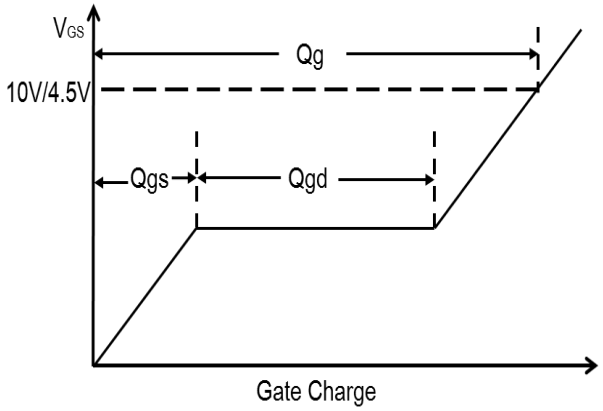

Fig.8 Gate Charge Waveform

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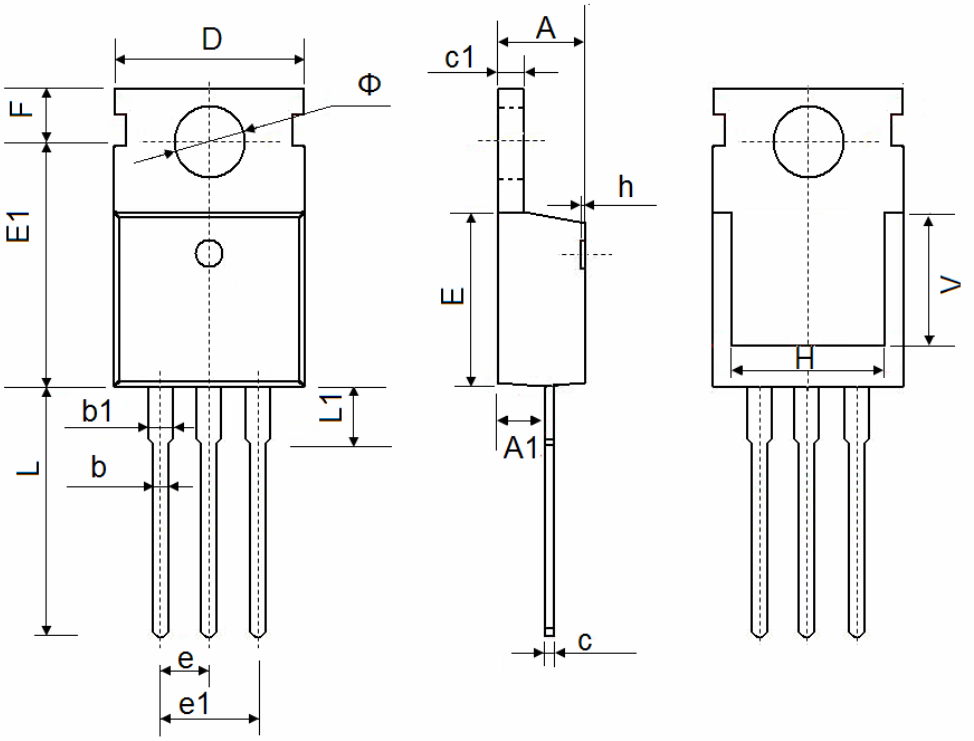
TO-220 Package Outline Data



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.350	4.650
A1	2.250	2.550
b	0.710	0.910
b1	1.170	1.400
c	0.330	0.650
c1	1.200	1.400
D	9.910	10.250
E	8.9500	9.750
E1	12.650	12.950
e	2.540 TYP.	
e1	4.980	5.180
F	2.650	2.950
H	7.900	8.100
h	0.000	0.300
L	12.700	13.500
L1	2.850	3.250
V	7.500 REF.	
Φ	3.400	3.800