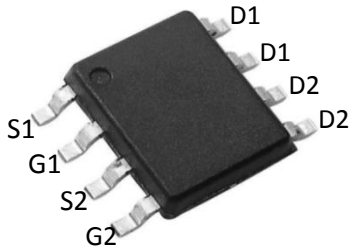
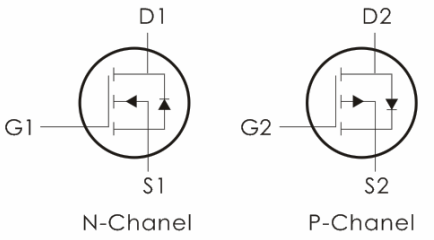
Description：

This N-Chanel and P-Channel MOSFET use advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device may be used to form a level shifted high side switch, and for a host of other application.





Features：

N-Channel: V_{DS}=40V,I_D=6.7A,$R_{DS(ON)}$<32mΩ @V_{GS}=10V

P-Channel: V_{DS}=-40V,I_D=-7.2A,$R_{DS(ON)}$<40mΩ @V_{GS}=-10V

1) High Power and current handing capability.
2) Lead free product is acquired.
3) Surface Mount Package.

Absolute Maximum Ratings：(T_C=25℃ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Drain Current-Continuous	6.7	-7.2	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed[1]	26.8	-28.8	
P_D	Power Dissipation	2.5	2.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	-55 to +150	℃

Thermal Characteristics：

Channel	Symbol	Parameter	Max	Units
N	$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	℃/W
P	$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	

N-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
ON/Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=40V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=5A	---	24	32	mΩ
		V_{GS}=4.5V,I_D=3A	---	32	45	
G_{FS}	Forward Transconductance	V_{DS}=10V, I_D=3A	---	3.6	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	420	800	pF
C_{oss}	Output Capacitance		---	65	120	
C_{rss}	Reverse Transfer Capacitance		---	40	80	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time[2.3]	V_{DS}=20V, I_D=1A, V_{GS}=4.5V,R_{GEN}=25Ω	---	3.2	6	ns
t_r	Rise Time[2.3]		---	8.6	16	ns
$t_{d(off)}$	Turn-Off Delay Time[2.3]		---	18	36	ns
t_f	Fall Time[2.3]		---	6	12	ns
Q_g	Total Gate Charge[2.3]	V_{GS}=4.5V, V_{DS}=20V, I_D=3A	---	2.8	5.6	nC
Q_{gs}	Gate-Source Charge[2.3]		---	0.5	1	nC
Q_{gd}	Gate-Drain “Miller” Charge[2.3]		---	1.5	3	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[1]	V_{GS}=0V,I_S=1A	---	---	1	V
LS	Continuous Source Current	·V_G=V_D=0V , Force Current		---	6.7	A
LSM	Pulsed Source Current			---	13.4	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Characteristics: (T_C=25℃ unless otherwise noted)

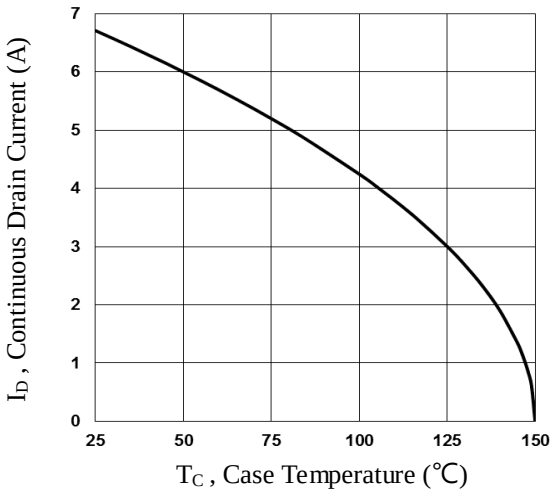


Fig.1 Continuous Drain Current vs. T_C

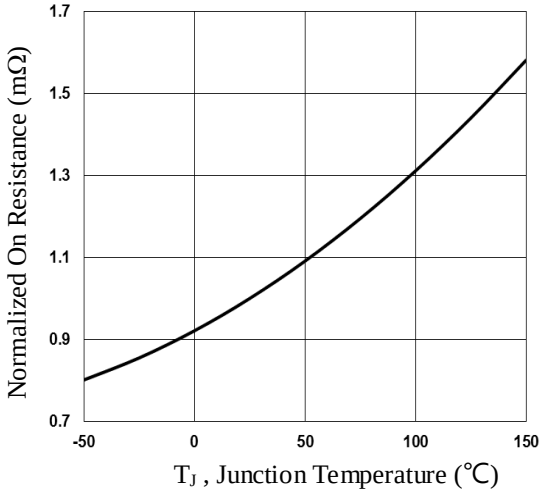


Fig.2 Normalized RDSON vs. T_J

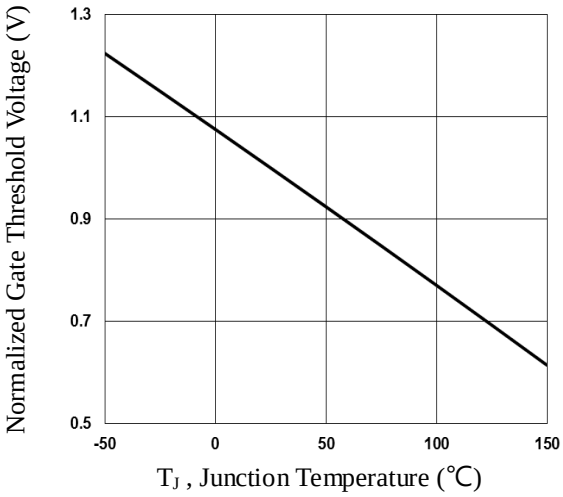


Fig.3 Normalized V_{th} vs. T_J

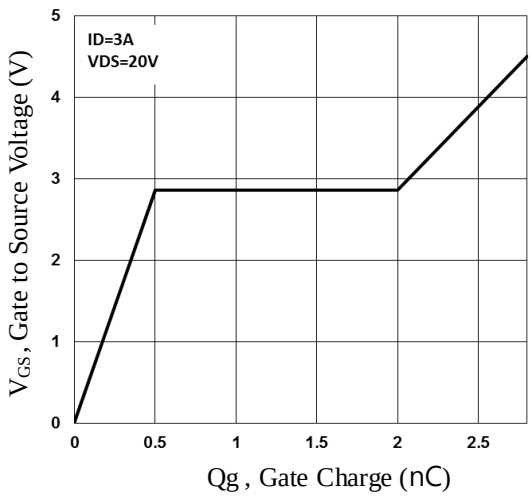


Fig.4 Gate Charge Waveform

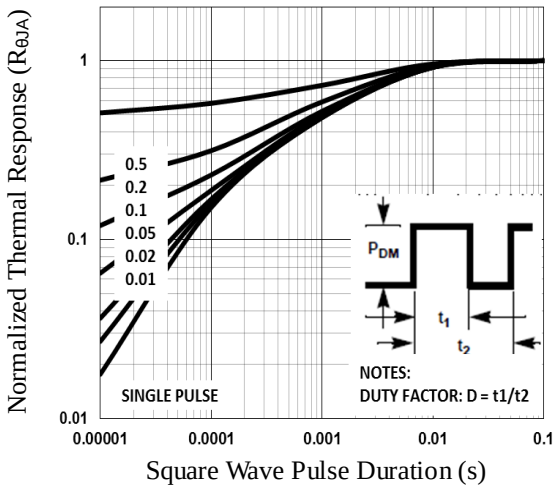


Fig.5 Normalized Transient Impedance

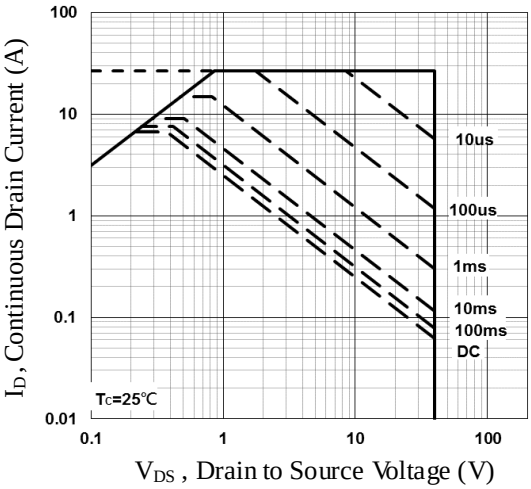


Fig.6 Maximum Safe Operation Area

P-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
ON/Off States						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-40V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	-1	-1.6	-2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=-10V,I_D=-4A	---	32	40	mΩ
G_{FS}	Forward Transconductance	V_{DS}=-10V, I_D=-3A	---	5	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	1050	1600	pF
C_{oss}	Output Capacitance		---	110	160	
C_{rss}	Reverse Transfer Capacitance		---	80	120	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time[2.3]	V_{DS}=-20V,V_{GS}=-4.5V, R_{GEN}=25Ω . I_D=-1A	---	20	40	ns
t_r	Rise Time[2.3]		---	12	24	ns
$t_{d(off)}$	Turn-Off Delay Time[2.3]		---	46	80	ns
t_f	Fall Time[2.3]		---	6	12	ns
Q_g	Total Gate Charge[2.3]	V_{GS}=-4.5V, V_{DS}=-20V, I_D=-2A	---	8	16	nC
Q_{gs}	Gate-Source Charge[2.3]		---	2.1	4.2	nC
Q_{gd}	Gate-Drain “Miller” Charge[2.3]		---	3.6	7.2	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[3]	V_{GS}=0V,I_S=-1A	---	--	-1	V
LS	Continuous Source Current	·V_G=V_D=0V , Force Current		---	-7.2	A
LSM	Pulsed Source Current			---	-14.4	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Characteristics: (T_C=25℃ unless otherwise noted)

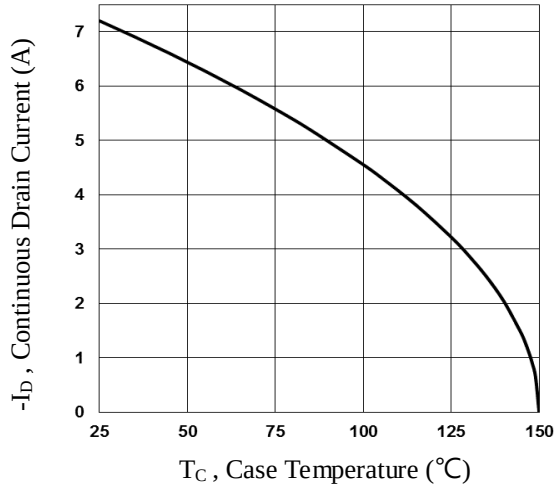


Fig.7 Continuous Drain Current vs. T_C

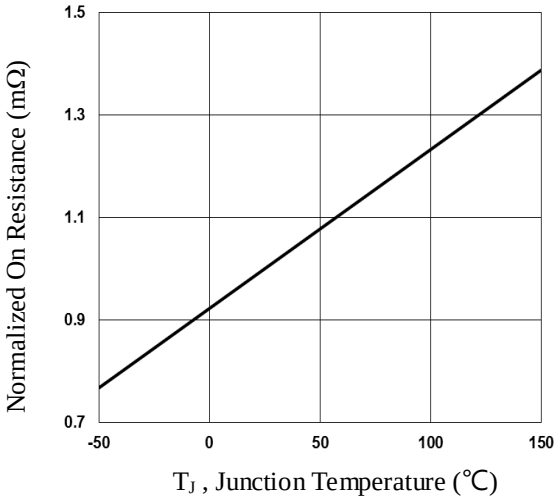


Fig.8 Normalized RDSON vs. T_J

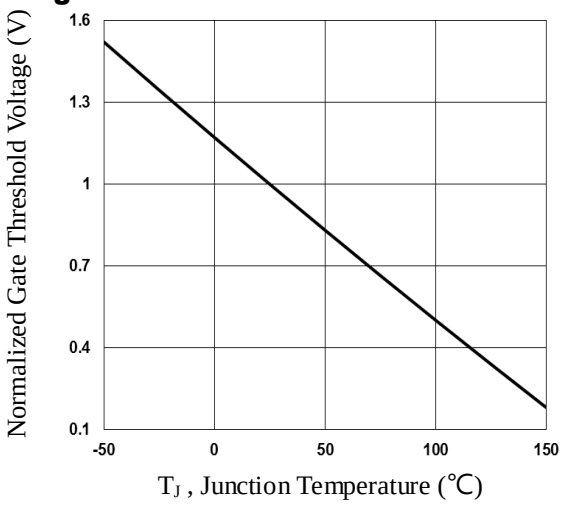


Fig.9 Normalized V_{th} vs. T_J

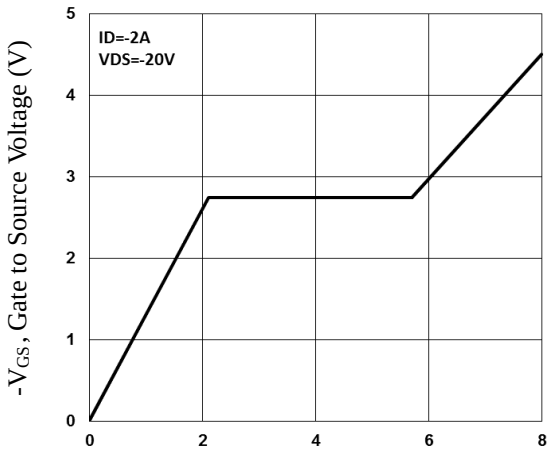


Fig.10 Gate Charge Waveform

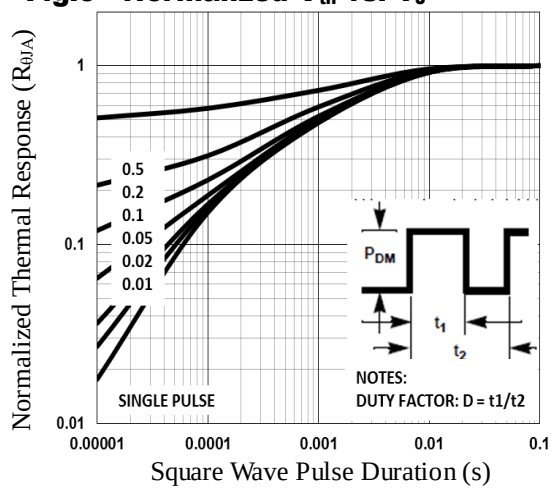


Fig.11 Normalized Transient Impedance

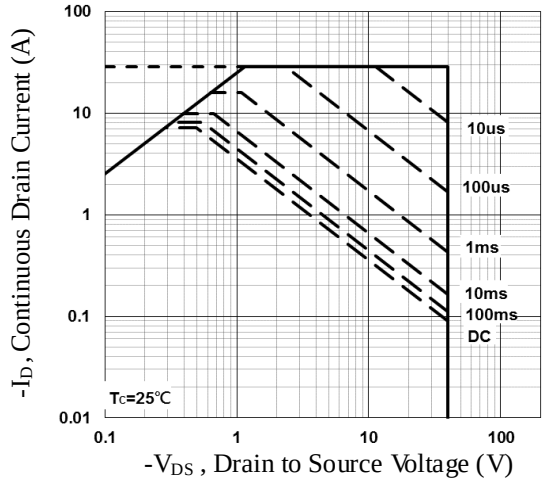


Fig.12 Maximum Safe Operation Area

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