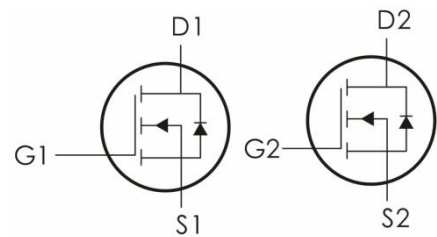
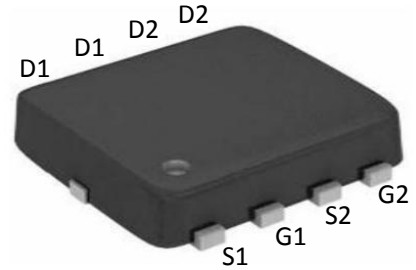


Description:

These Dual N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.



Features:

- 1) $V_{DS}=40V, I_D=25A, R_{DS(ON)}=13m\Omega @V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- ($T_C=25^\circ C$)	25	A
	Continuous Drain Current- ($T_C=100^\circ C$)	20.5	
I_{DM}	Drain Current – Pulsed ¹	138	A
E_{AS}	Single Pulse Avalanche Energy ^{2,6}	45	mJ
I_{AS}	Single Pulse Avalanche Current ²	23	A
P_D	Power Dissipation ($T_C=25^\circ C$)	34.7	W
	Power Dissipation – Derate above $25^\circ C$	0.28	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.6	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
SI7288DP-T1-GE3	SI7288	DFN5*6-8D

Electrical Characteristics : ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250 \mu A$	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=40V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{GS}=0V, V_{DS}=32V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250 \mu A$	1.2	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=15A$	---	9.7	13	m Ω
		$V_{GS}=4.5V, I_D=12A$	---	13	20	
G_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=3A$	---	6	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	1100	2150	pF
C_{oss}	Output Capacitance		---	110	220	
C_{rss}	Reverse Transfer Capacitance		---	80	175	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{3,4}	$V_{DD}=20V, V_{GS}=10V, R_G=6 \Omega, I_D=1A$	---	8	16	ns
t_r	Rise Time ^{3,4}		---	3.2	8	ns
$t_{d(off)}$	Turn-Off Delay Time ^{3,4}		---	26.4	52	ns
t_f	Fall Time ^{3,4}		---	3.8	8	ns

Q_g	Total Gate Charge ^{3,4}	$V_{DS}=20V, V_{GS}=10V, I_D=10A$	---	16.9	32	nC
Q_{gs}	Gate-Source Charge ^{3,4}		---	2	4	nC
Q_{gd}	Gate-Drain "Miller" Charge ^{3,4}		---	4.4	9	nC
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	---	2.8	---	Ω
Drain-Source Diode characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	42	A
I_{SM}	Pulsed Source Current		---	---	84	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A, R_G=25\Omega$, Starting $T_J=25^\circ C$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

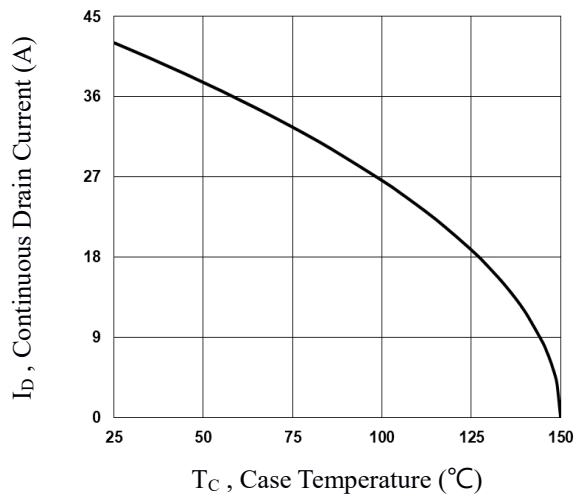


Fig.1 Continuous Drain Current vs. T_C

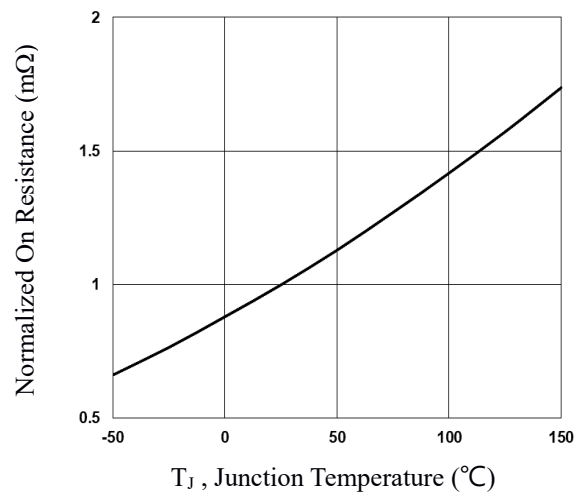


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

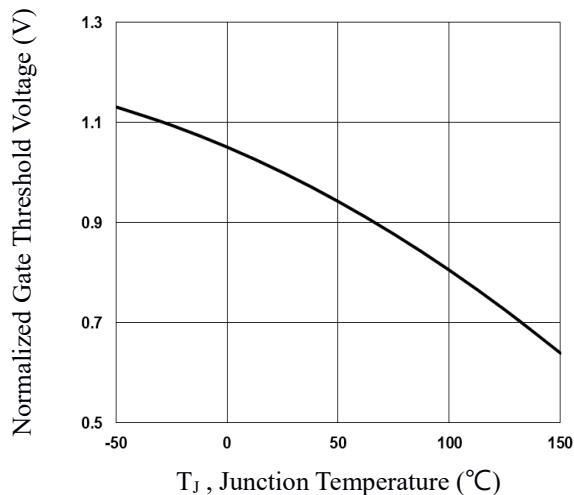


Fig.3 Normalized V_{th} vs. T_J

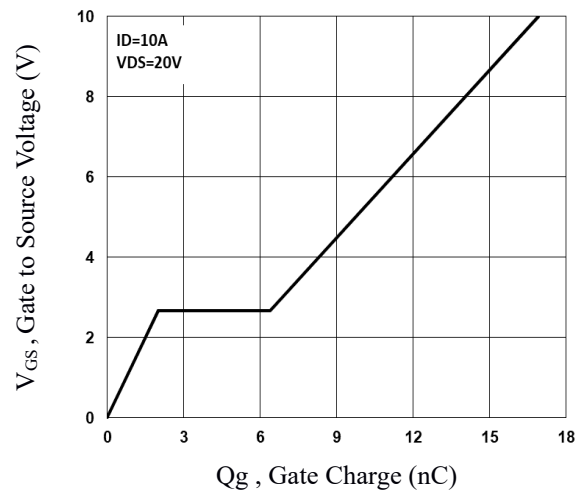


Fig.4 Gate Charge Waveform

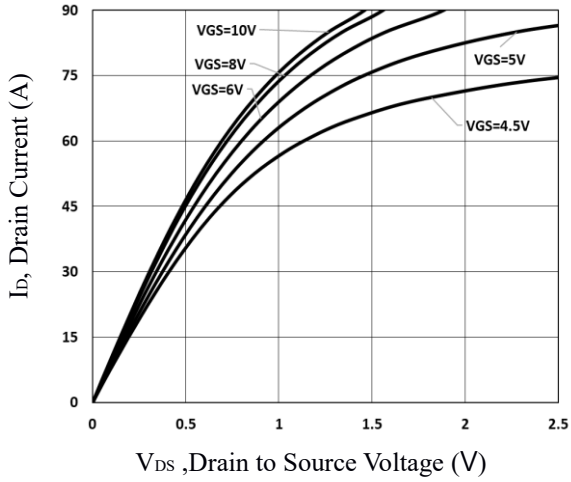


Fig.5 Typical Output Characteristics

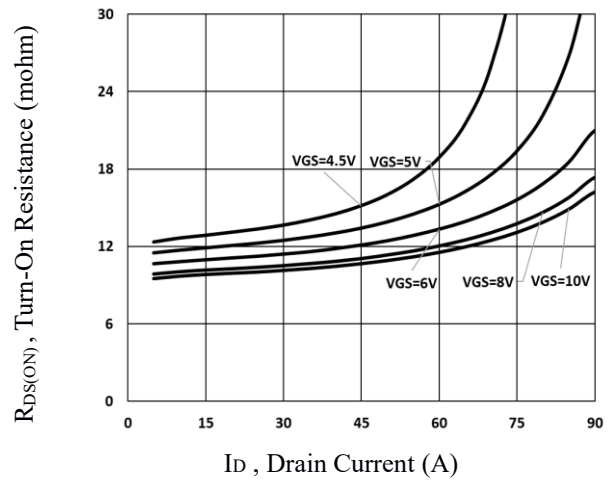


Fig.6 Turn-On Resistance vs. I_D

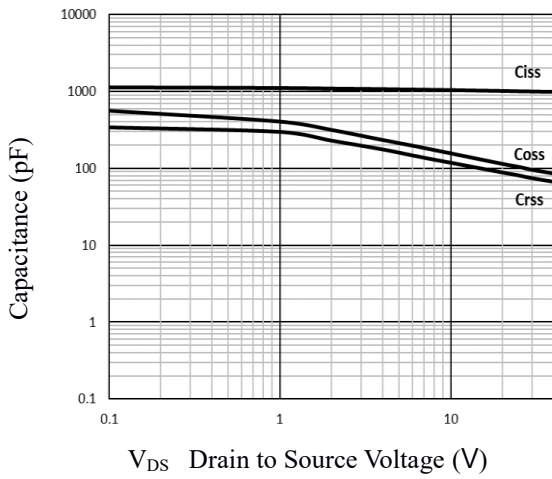


Fig.7 Capacitance Characteristics

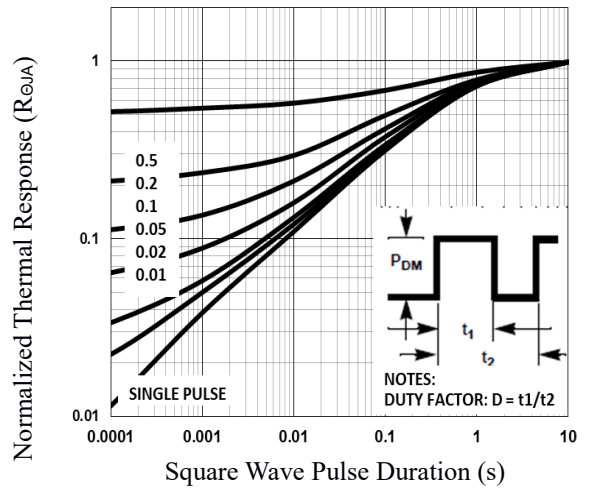


Fig.8 Normalized Transient Response

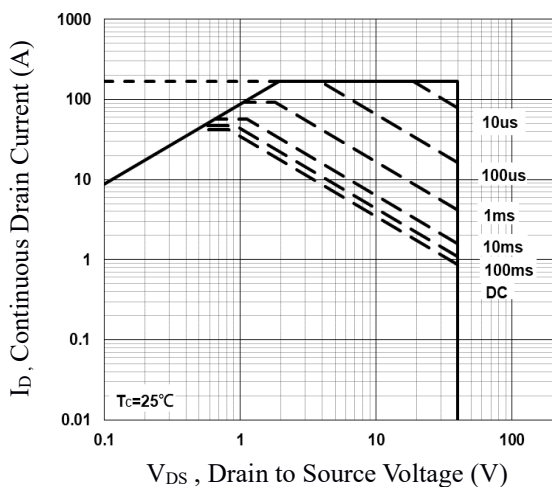


Fig.9 Maximum Safe Operation Area