

General Description

These 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

20V, 0.8A, $R_{DS(ON)} = 110m\Omega @ V_{GS} = 4.5V$

Improved dv/dt capability

Fast switching

Green Device Available

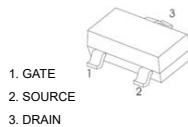
Applications

Notebook

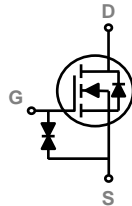
Load Switch

Battery Protection

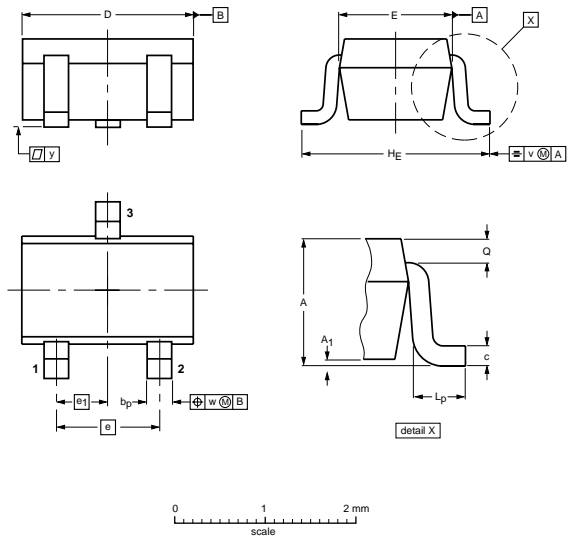
Hand-held Instruments



1. GATE
2. SOURCE
3. DRAIN



SOT-323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

BVDSS	RDSON	ID
20V	110mΩ	0.8A

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Non-Repetitive Peak Reverse Voltage	V _{RM}	100	V
Reverse Voltage	V _R	75	V
Continuous Forward Current	I _F	175	mA
Single diode loaded Double diode loaded		100	
Repetitive Peak Forward Current	I _{FRM}	500	mA
Non-repetitive Peak Forward Surge Current	I _{FSM}	0.5	A
at t = 1 s		1	
at t = 1 ms at t = 1 μs		4	
Power Dissipation	P _{tot}	200	mW
Junction Temperature	T _j	150	°C
Storage Temperature Range	T _{stg}	- 65 to + 150	°C

DMG1012UW

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	-0.01	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±10V, V _{DS} =0V	---	---	±10	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =0.6A	---	110	180	mΩ
		V _{GS} =2.5V, I _D =0.5A	---	160	250	
		V _{GS} =1.8V, I _D =0.2A	---	300	500	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.4	0.7	1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	3	---	mV/°C

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2,3}	V _{DS} =10V, V _{GS} =4.5V, I _D =0.5A	---	1	---	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.26	---	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	0.2	---	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =10V, V _{GS} =4.5V, R _G =10Ω I _D =0.5A	---	5	---	ns
T _r	Rise Time ^{2,3}		---	3.5	---	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	14	---	
T _f	Fall Time ^{2,3}		---	6	---	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	38.2	---	pF
C _{oss}	Output Capacitance		---	14.4	---	
C _{rss}	Reverse Transfer Capacitance		---	6	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	0.8	A
I _{SM}	Pulsed Source Current		---	---	1.2	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =0.5A, T _J =25°C	---	---	1.2	V

Note :

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.

RATING AND CHARACTERISTIC CURVES (DMG1012UW)

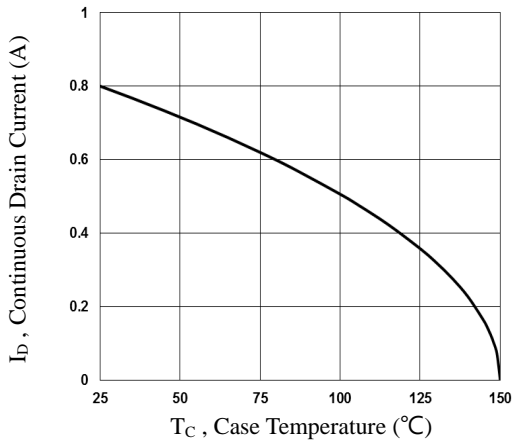


Fig.1 Continuous Drain Current vs. T_c

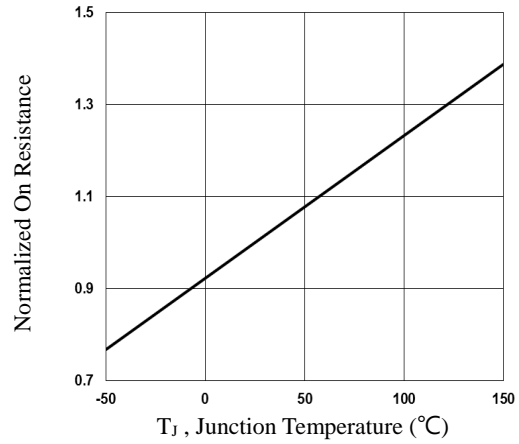


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

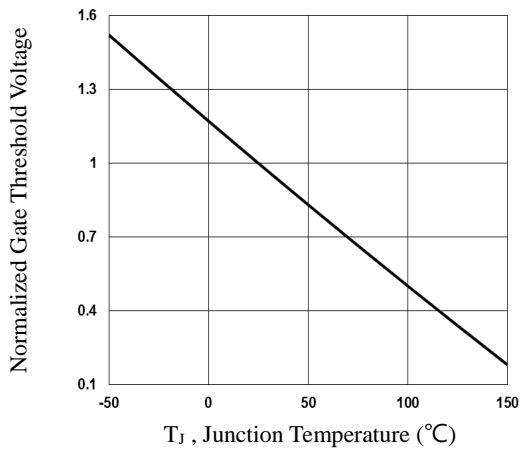


Fig.3 Normalized V_{th} vs. T_j

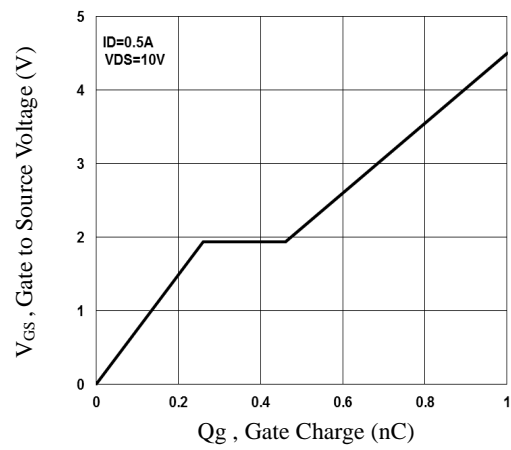


Fig.4 Gate Charge Waveform

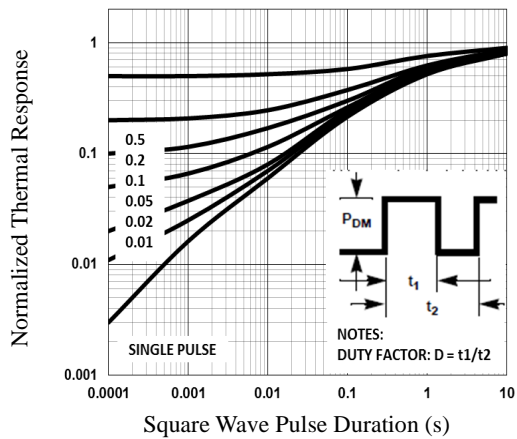


Fig.5 Normalized Transient Response

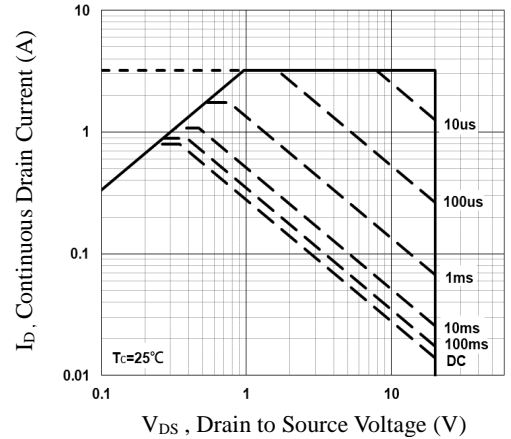


Fig.6 Maximum Safe Operation Area

RATING AND CHARACTERISTIC CURVES (DMG1012UW)

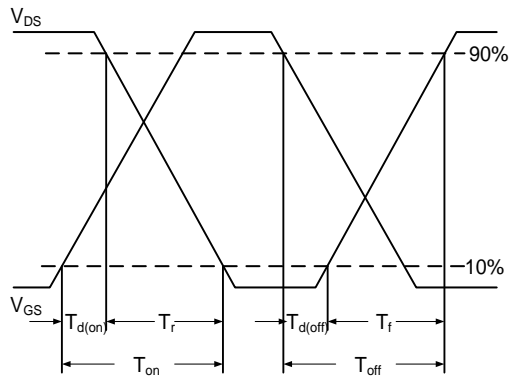


Fig.7 Switching Time Waveform

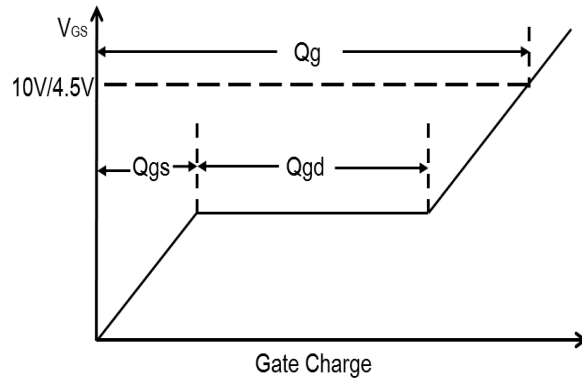


Fig.8 Gate Charge Waveform