

General Description

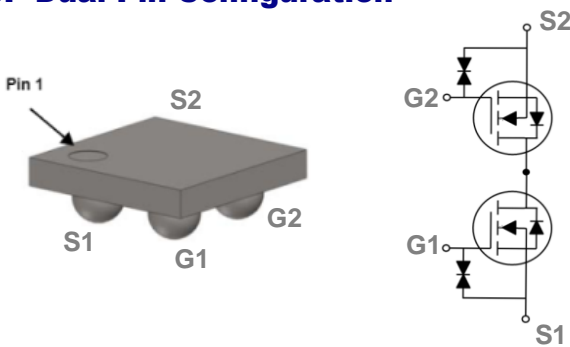
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVSSS	RSSON	IS
24V	31mΩ	5.5A

Features

- 24V,5.5A, $R_{SS}(ON) = 31m\Omega$ @ $V_{GS} = 4.5V$
- Fast switching
- G-S ESD Protection Diode Embedded
- Green Device Available

CSP Dual Pin Configuration



Applications

- Battery Management
- POL Applications
- Battery Protection Applications
- 1-Cell Lithium-ion Battery Charging and Discharging Switch

Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{S1S2}	Source1-Source2 Voltage	24	V
V_{GS}	Gate-Source Voltage	± 12	V
I_{S1S2}	Source1 - Source2 Current – Continuous ($T_c=25^\circ C$)	5.5	A
	Source1 - Source2 Current – Continuous ($T_c=100^\circ C$)	3.5	A
I_{SM}	Source1 - Source2 Current – Pulsed ¹	55	A
P_D	Power Dissipation ($T_c=25^\circ C$)	1.5	W
	Power Dissipation – Derate above $25^\circ C$	0.012	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	83	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{SSS}	Source1 - Source2 Breakdown Voltage	V _{GS} =0V , I _D =250uA	24	---	---	V
I _{S1S2}	Source1 - Source2 Leakage Current	V _{DS} =24V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =20V , V _{GS} =0V , T _J =85°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V , V _{DS} =0V	---	---	±10	uA

On Characteristics

R _{SS(ON)}	Static Source1-Source2 On-Resistance ³	V _{GS} =4.5V , I _D =3A	21	26	31	mΩ
		V _{GS} =4V , I _D =3A	22	27	33	mΩ
		V _{GS} =3.7V , I _D =3A	24	29	36	mΩ
		V _{GS} =3.1V , I _D =3A	26	31	40	mΩ
		V _{GS} =2.5V , I _D =3A	30	37	47	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.4	0.7	1.2	V
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =3A	---	4	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2,3}	V _{DS} =20V , V _{GS} =4.5V , I _D =3A	---	10.4	---	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.7	---	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	4.3	---	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =15V , V _{GS} =10V , R _G =6Ω I _D =3A	---	28	---	ns
T _r	Rise Time ^{2,3}		---	64	---	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	60	---	
T _f	Fall Time ^{2,3}		---	55	---	

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	---	---	5.5	A
I _{SM}	Pulsed Source Current		---	---	11	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1	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.

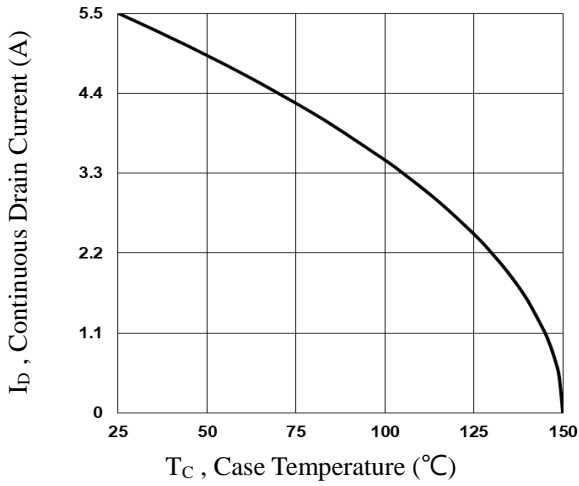


Fig.1 Continuous Drain Current vs. T_C

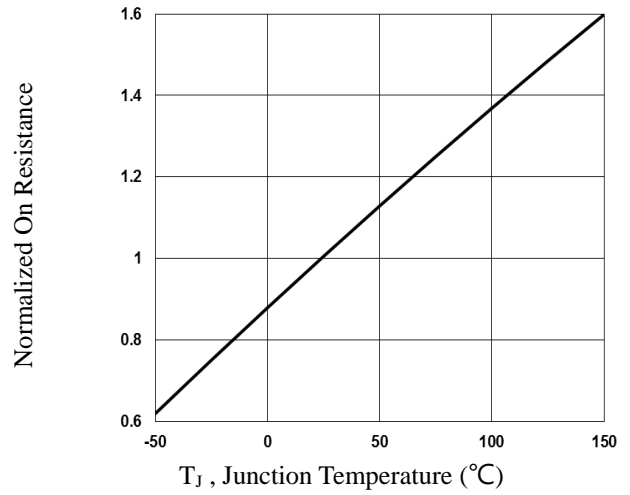


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

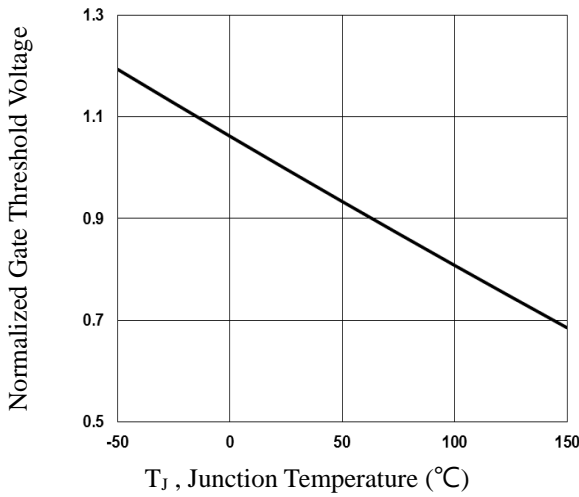


Fig.3 Normalized V_{th} vs. T_J

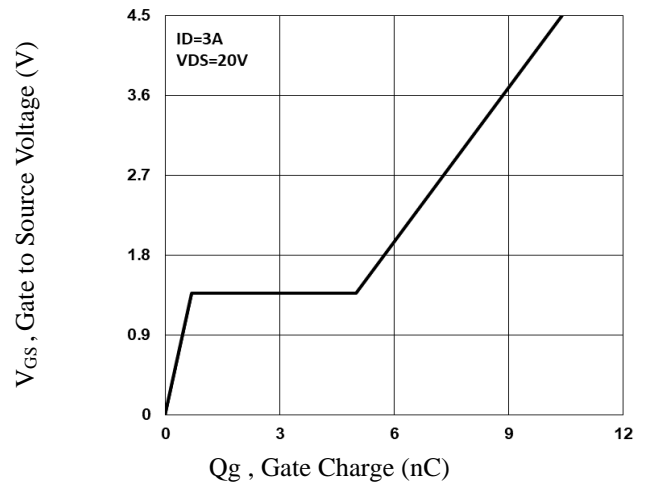


Fig.4 Gate Charge Waveform

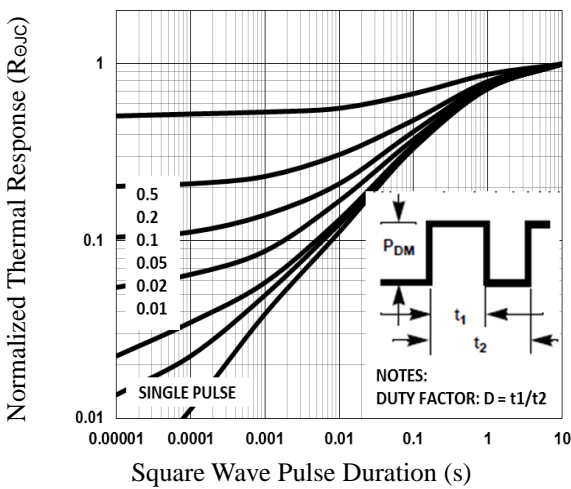


Fig.5 Normalized Transient Response

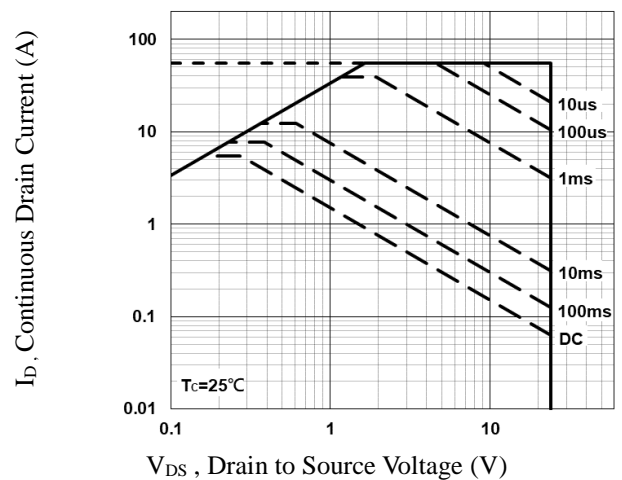
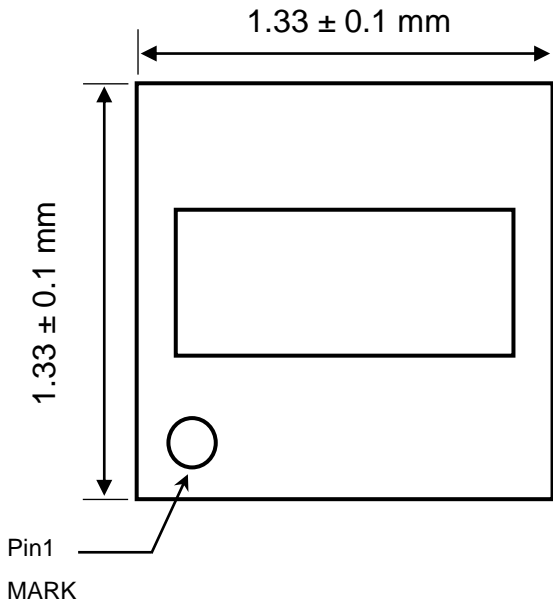


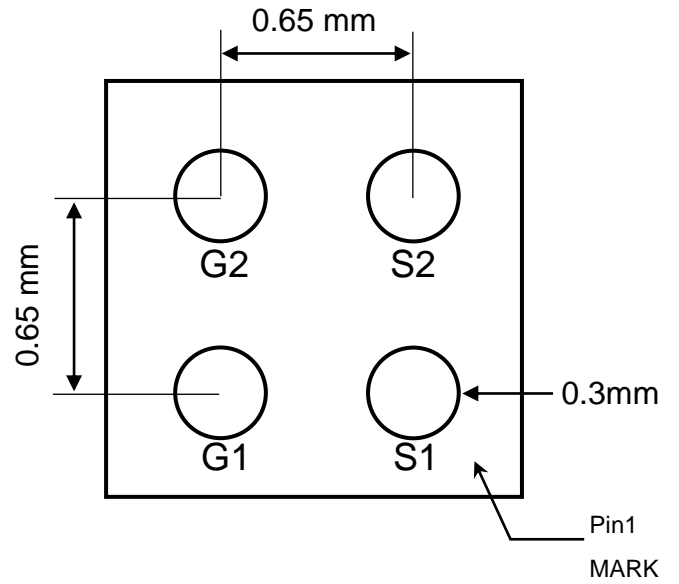
Fig.6 Maximum Safe Operation Area

CSP Dual PACKAGE INFORMATION

TOP VIEW



BOTTOM VIEW



Thickness

