PWEF25D2S

General Description

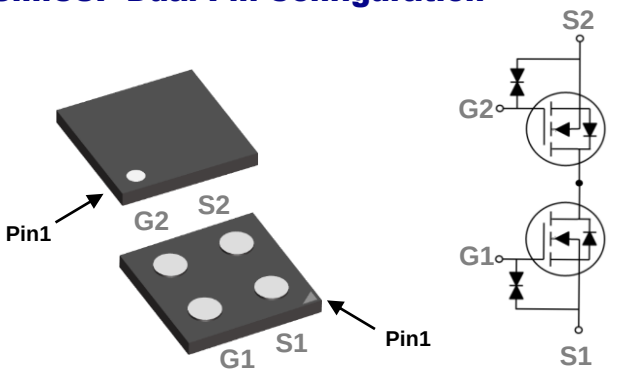
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVSSS	RSSON	IS
24V	46mΩ	6A

Features

- *24V,6A, RSS(ON) =46mΩ @VGS = 4.5V*
- *Fast switching*
- *G-S ESD Protection Diode Embedded*
- *Green Device Available*

SimCSP Dual Pin Configuration



Applications

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

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{SS}	Source-Source Voltage	24	V
V_{GS}	Gate-Source Voltage	±12	V
I_S	Source Current – Continuous (T_A=25℃)	6	A
	Source Current – Continuous (T_A=70℃)	4.8	A
I_{SM}	Source Current – Pulsed [1]	60	A
P_D	Power Dissipation (T_A=25℃)	2	W
	Power Dissipation – Derate above 25℃	0.016	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	65	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{SSS}	Source1 - Source2 Breakdown Voltage	V_{GS}=0V , I_D=250μA	24	---	---	V
I_{SSS}	Zero Gate Voltage Source Current	V_{SS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	μA
		V_{SS}=20V , V_{GS}=0V , T_J=85℃	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±10	μA

On Characteristics

$R_{SS(ON)}$	Static Source-Source On-Resistance	V_{GS}=4.5V , I_S=3A	31	38	46	mΩ
		V_{GS}=4V , I_S=3A	32	39	47	mΩ
		V_{GS}=3.7V , I_S=3A	34	41	49	mΩ
		V_{GS}=3.1V , I_S=3A	36	44	57	mΩ
		V_{GS}=2.5V , I_S=3A	42	51	66	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{SS} , I_S =250μA	0.4	0.8	1.2	V

Dynamic and switching Characteristics[2]

Q_g	Total Gate Charge	V_{SS}=12V , V_{GS}=10V , I_S=2A	---	17	34	nC
Q_{gs}	Gate-Source Charge		---	1.3	5	
Q_{gd}	Gate-Drain Charge		---	13.6	30	
$T_{d(on)}$	Turn-On Delay Time	V_{SS}=12V , V_{GS}=10V , R_G=6Ω , I_S=2A	---	20	40	ns
T_r	Rise Time		---	24	50	
$T_{d(off)}$	Turn-Off Delay Time		---	50	100	
T_f	Fall Time		---	26	55	
C_{iss}	Input Capacitance	V_{SS}=12V , V_{GS}=0V , F=1MHz	---	310	650	pF
C_{oss}	Output Capacitance		---	70	150	
C_{rss}	Reverse Transfer Capacitance		---	35	80	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_S=0V , Force Current	---	---	6	A
VF_{SS}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Essentially independent of operating temperature.

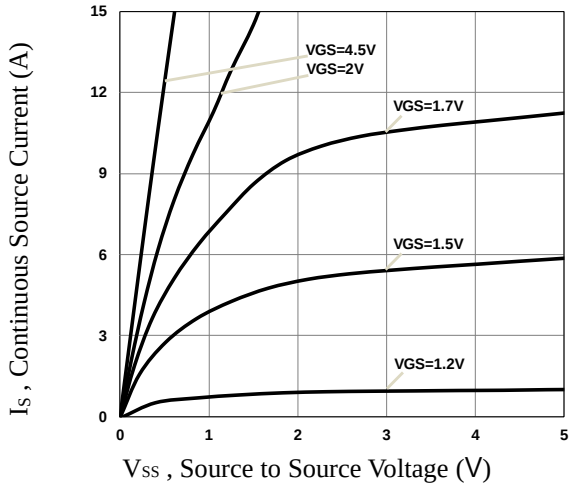


Fig.1 Typical Output Characteristics

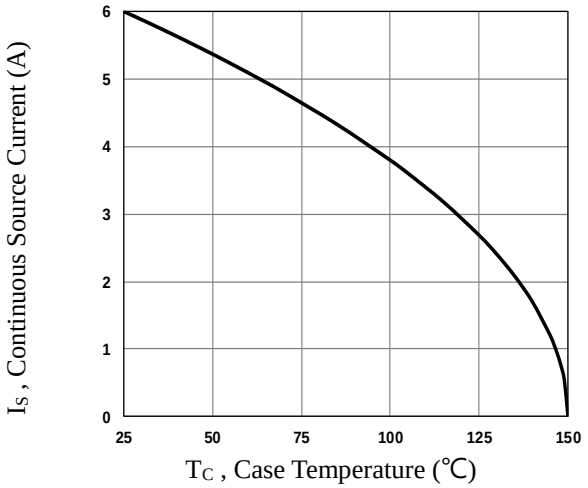


Fig.2 Continuous Source Current vs. T_c

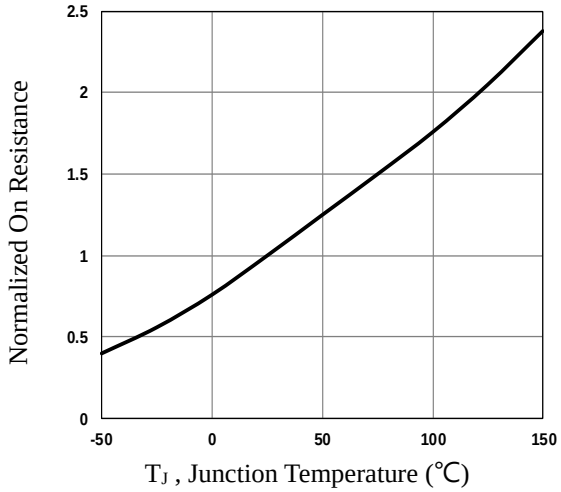


Fig.3 Normalized RDSON vs. T_J

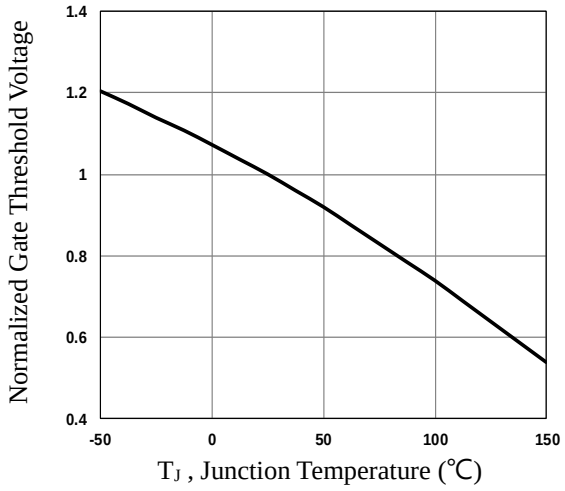


Fig.4 Normalized V_{th} vs. T_J

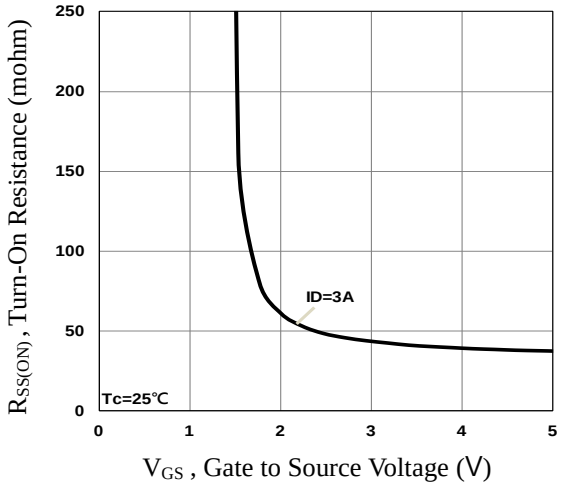


Fig.5 Turn-On Resistance vs. V_{GS}

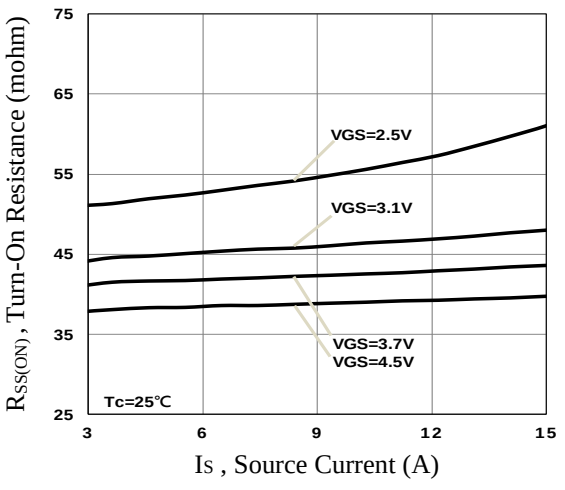


Fig.6 Turn-On Resistance vs. Is

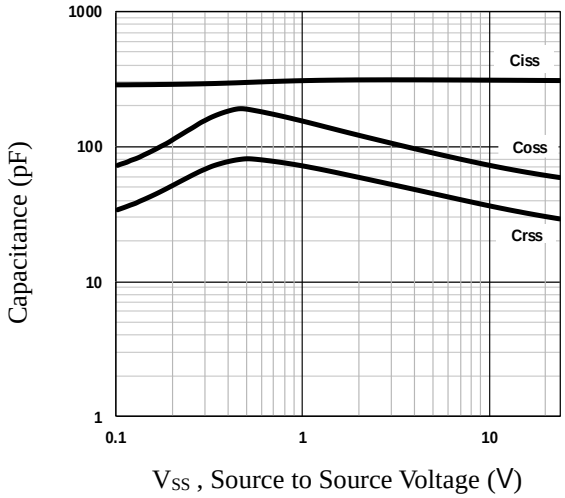


Fig.7 Capacitance Characteristics

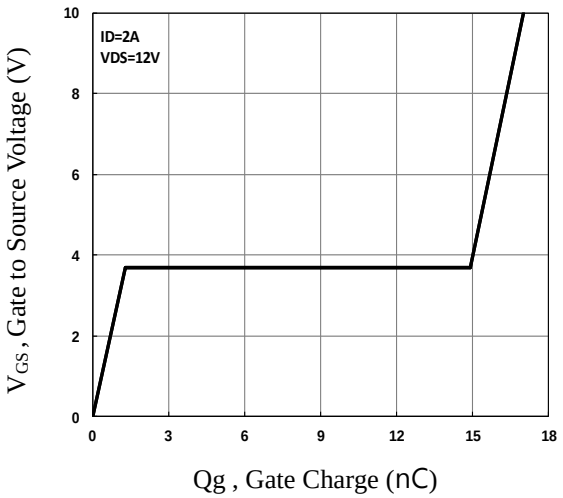


Fig.8 Gate Charge Characteristics

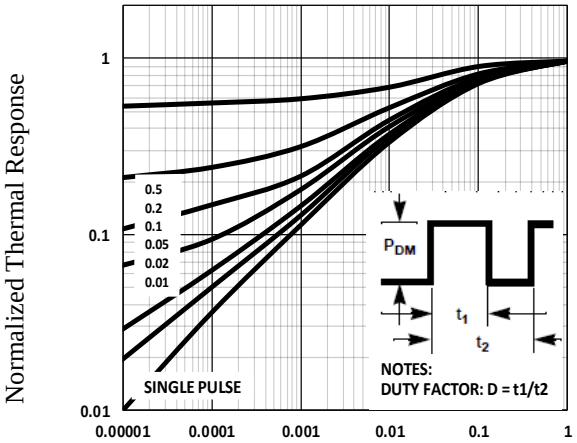


Fig.9 Normalized Transient Impedance

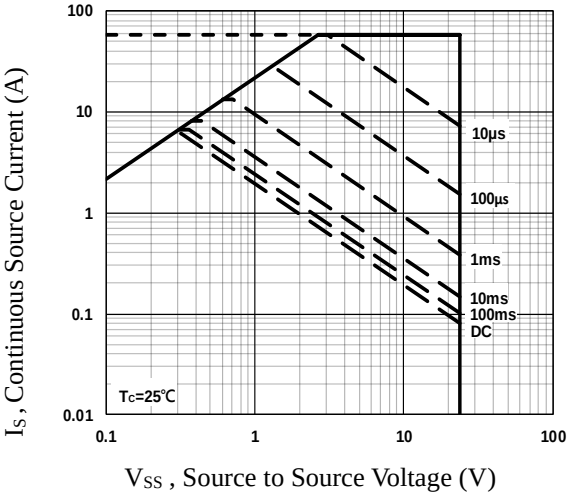


Fig.10 Maximum Safe Operation Area

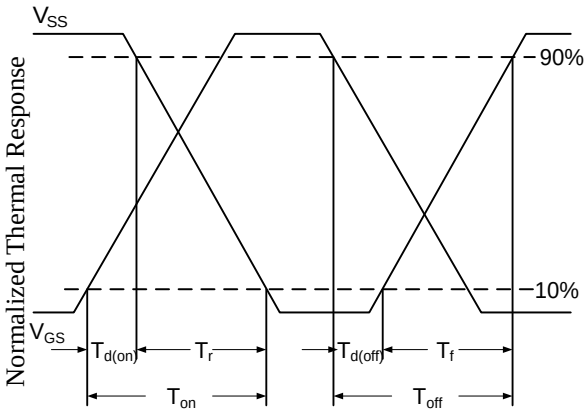


Fig.11 Switching Time Waveform

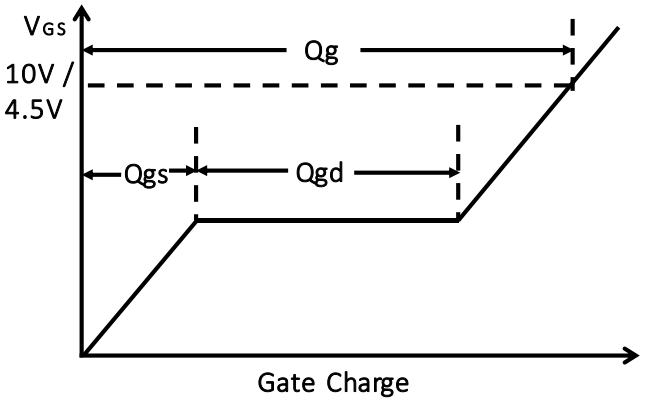
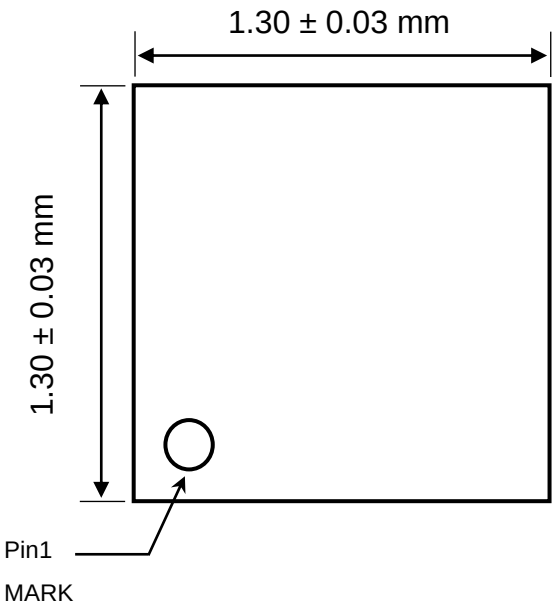


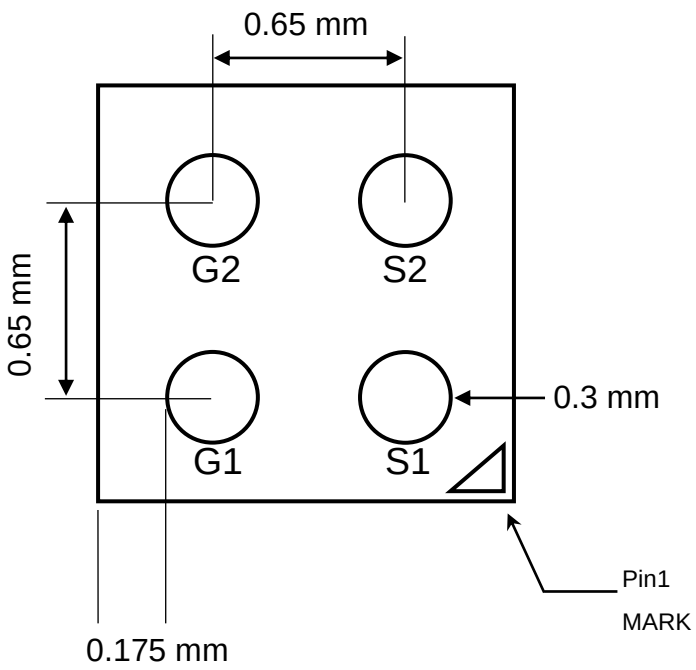
Fig.12 Gate Charge Waveform

SimCSP Dual PACKAGE INFORMATION

TOP VIEW



BOTTOM VIEW



Thickness