

General Description

The HSCC8233 is the low R_{DS(on)} trench N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.

The HSCC8233 meet the RoHS and Green Product requirement with full function reliability approved.

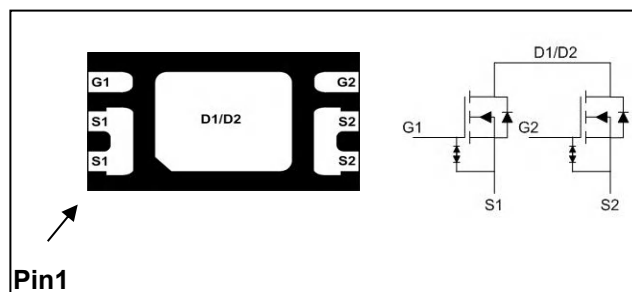
Product Summary

V _{DS}	20	V
R _{DS(ON),max}	7.2	mΩ
I _D	11	A

Features

- Low drain-source ON resistance
- Green Device Available
- ESD Protected Embedded

DFN2x3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	± 12	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ 4.5V ¹	11	A
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ 4.5V ¹	8.8	A
I _{DM}	Pulsed Drain Current ²	70	A
P _D @T _A =25°C	Total Power Dissipation ¹	1.56	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	---	80	°C/W

N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V$, $I_D=5.5A$	---	---	7.2	$m\Omega$
		$V_{GS}=4.0V$, $I_D=5.5A$	---	---	7.5	
		$V_{GS}=3.7V$, $I_D=5.5A$	---	---	8.2	
		$V_{GS}=3.1V$, $I_D=5.5A$	---	---	9	
		$V_{GS}=2.5V$, $I_D=5.5A$	---	---	10.2	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	0.6	1.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 8V$, $V_{DS}=0V$	---	---	± 10	μA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=5.5A$	---	38	---	S
Q_g	Total Gate Charge (4.5V)	$V_{DS}=16V$, $V_{GS}=4.5V$, $I_D=11A$	---	22	---	nC
Q_{gs}	Gate-Source Charge		---	3.4	---	
Q_{gd}	Gate-Drain Charge		---	8.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$, $V_{GS}=4.5V$, $R_G=6\Omega$ $I_D=5.5A$	---	10	---	ns
T_r	Rise Time		---	41	---	
$T_{d(off)}$	Turn-Off Delay Time		---	65	---	
T_f	Fall Time		---	30	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1MHz$	---	1647	---	pF
C_{oss}	Output Capacitance		---	170	---	
C_{rss}	Reverse Transfer Capacitance		---	156	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	---	---	11	A
I_{SM}	Pulsed Source Current ²		---	---	70	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=11A$, $T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t \leq 10s$.

2.The data tested by pulsed , pulse width $\leq 10\mu s$, duty cycle $\leq 1\%$

Typical Characteristics

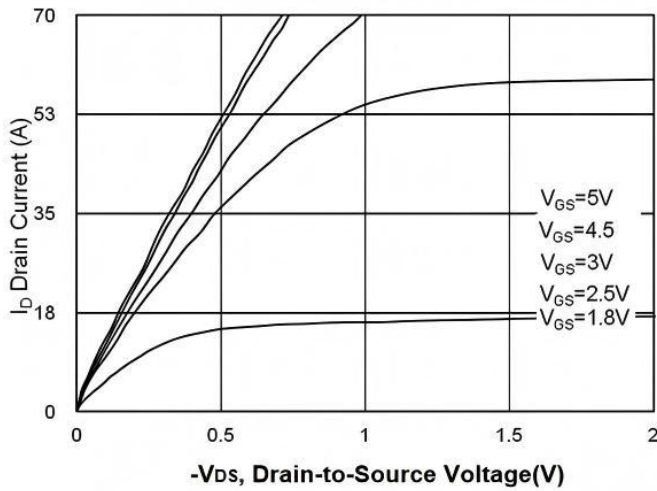


Fig.1 Typical Output Characteristics

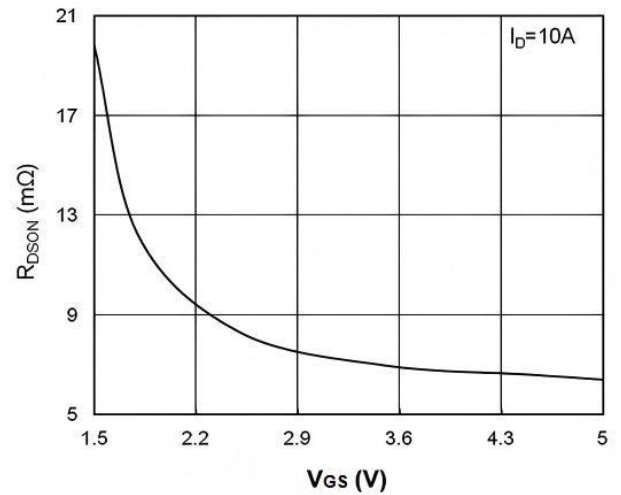


Fig.2 On-Resistance vs. G-S Voltage

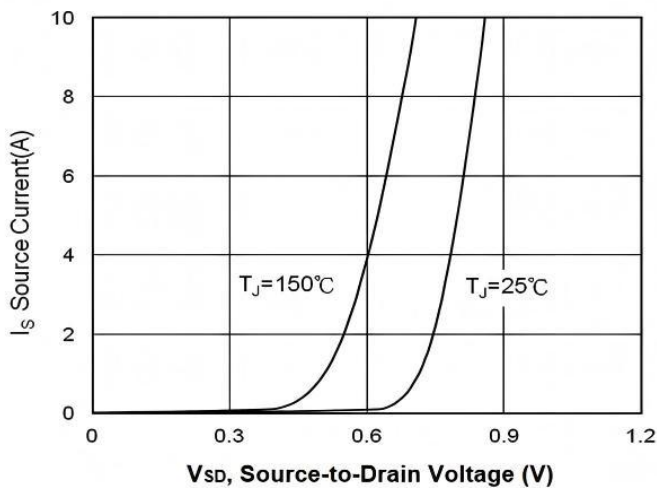


Fig.3 Forward Characteristics of Reverse diode

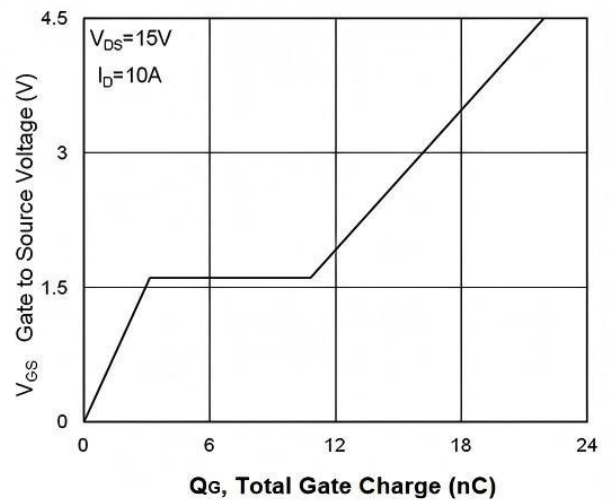


Fig.4 Gate-Charge Characteristics

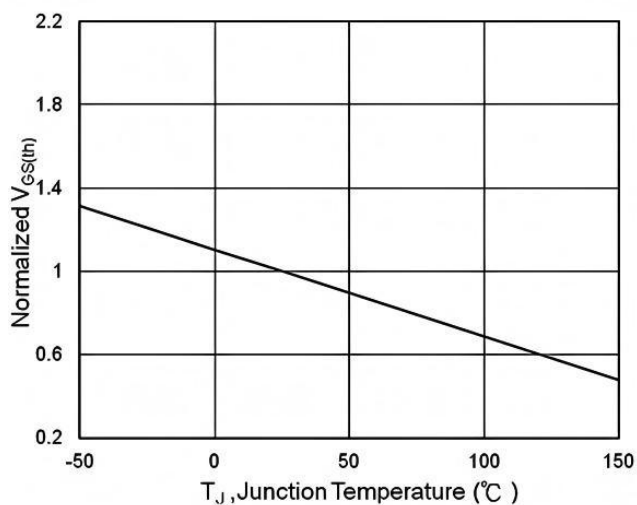


Fig.5 $V_{GS(th)}$ vs. T_J

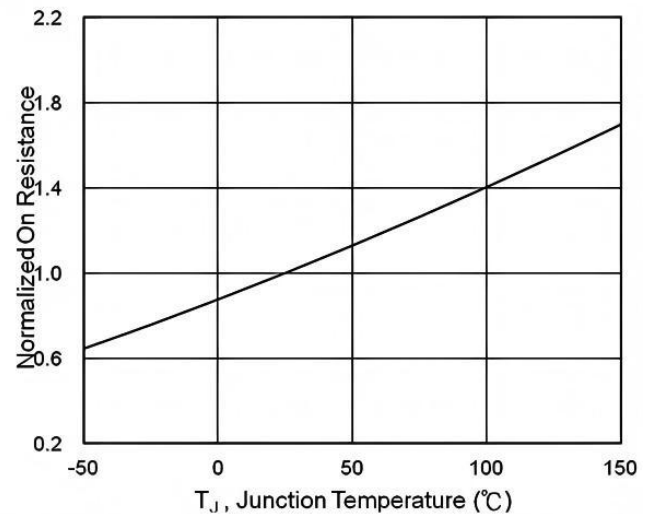


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

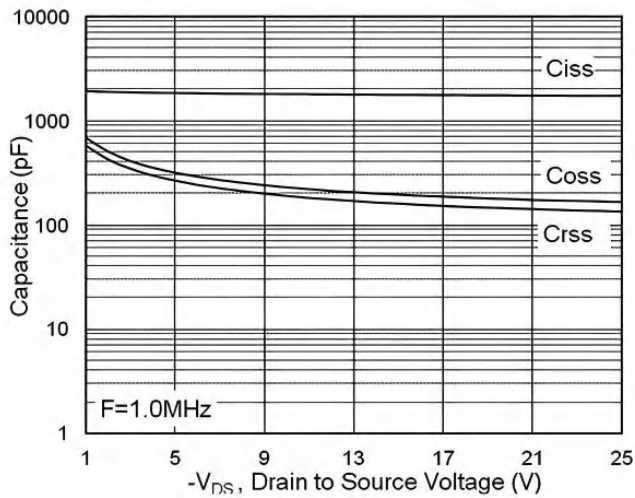


Fig.7 Capacitance

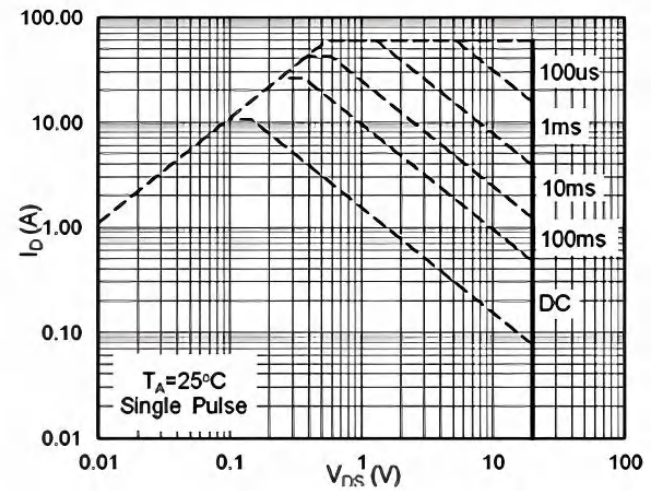


Fig.8 Safe Operating Area

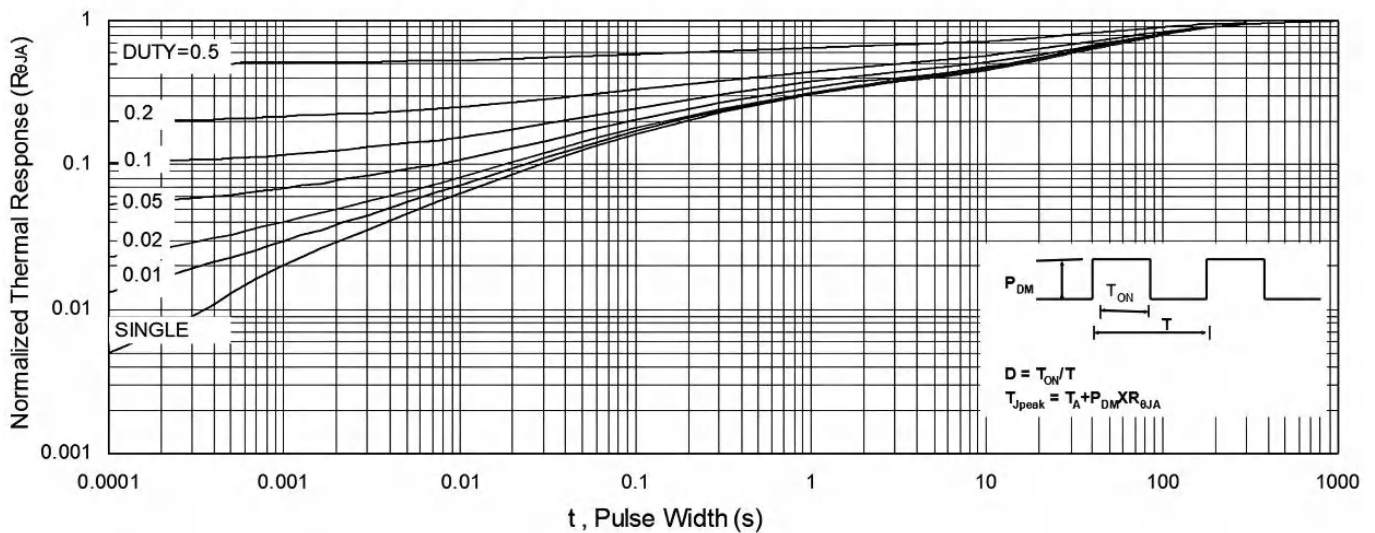


Fig.9 Normalized Maximum Transient Thermal Impedance

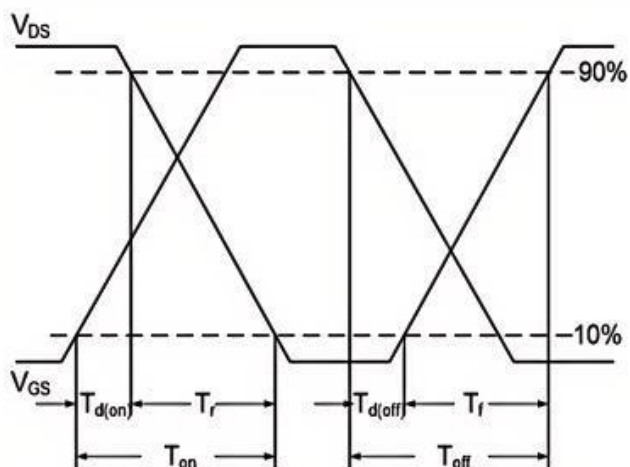


Fig.10 Switching Time Waveform

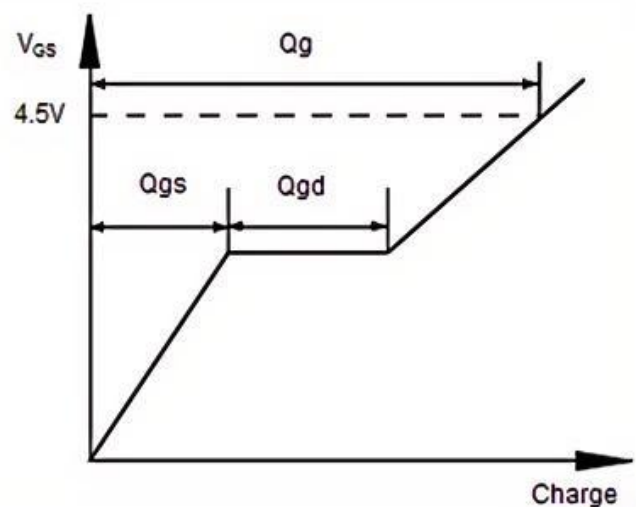
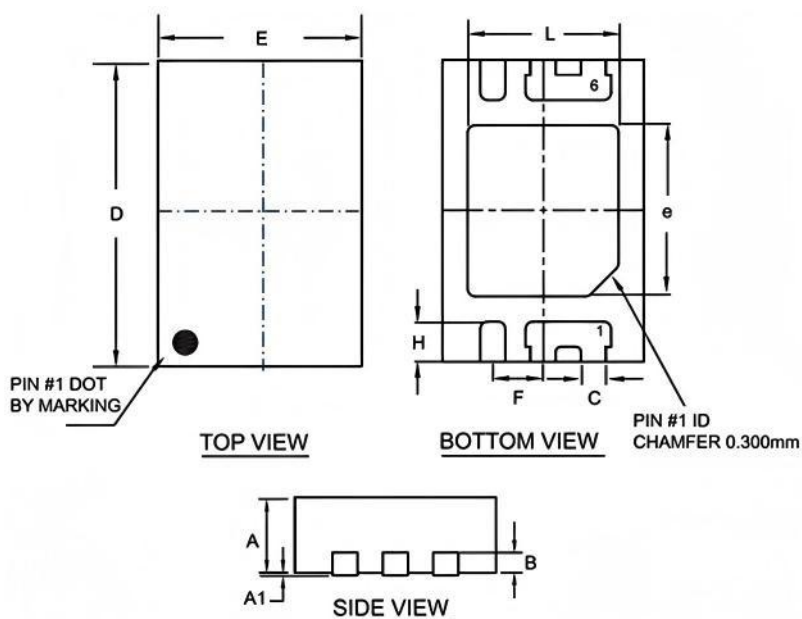


Fig.11 Gate Charge Waveform

Ordering Information

Part Number	Package code	Packaging
HSCC8233	DFN2*3	3000/Tape&Reel

DFN2*3 Package Outline



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
D	2.950	3.050	0.116	0.120
E	1.950	2.050	0.077	0.081
H	0.350	0.450	0.014	0.018
L	1.450	1.550	0.057	0.061
e	1.650	1.750	0.065	0.069
B	0.195	0.211	0.008	0.008
C	0.200	0.300	0.008	0.012
F	0.500 BSC		0.02 BSC	

HSCC8233 Marking:

