

General Description

The HSCC8204 is the low RDSON trench N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.

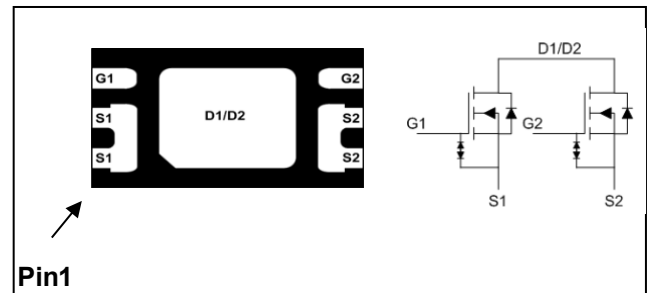
The HSCC8204 meet the RoHS and Green Product requirement with full function reliability approved.

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

Product Summary

V_{DS}	20	V
$R_{DS(ON),max}$	9	m Ω
I_D	9.5	A

DFN2x3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	9.5	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	7.6	A
I_{DM}	Pulsed Drain Current ²	60	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation ¹	1.56	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	---	80	$^\circ C/W$



N-Channel Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, 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	$V_{GS}=4.5V, I_D=5A$	6.3	7.8	9	m Ω
		$V_{GS}=4.0V, I_D=5A$	6.5	8.0	9.5	
		$V_{GS}=3.7V, I_D=5A$	6.7	8.2	10	
		$V_{GS}=3.1V, I_D=5A$	7.0	9.0	11.2	
		$V_{GS}=2.5V, I_D=5A$	8.0	10.5	13.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.45	---	1.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=55^\circ C$	---	---	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)	$V_{DS}=15V, V_{GS}=4.5V, I_D=5.5A$	---	22	---	nC
Q_{gs}	Gate-Source Charge		---	3.1	---	
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		---	39.5	---	
$T_{d(off)}$	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		---	148	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ¹	$V_G=V_D=0V, \text{Force Current}$	---	---	9.5	A
I_{SM}	Pulsed Source Current ²		---	---	60	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=9.5A, T_J=25^\circ C$	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, $t \leq 10s$.
- 2.The data tested by pulsed , pulse width $\leq 10\mu s$, duty cycle $\leq 1\%$



Typical Characteristics

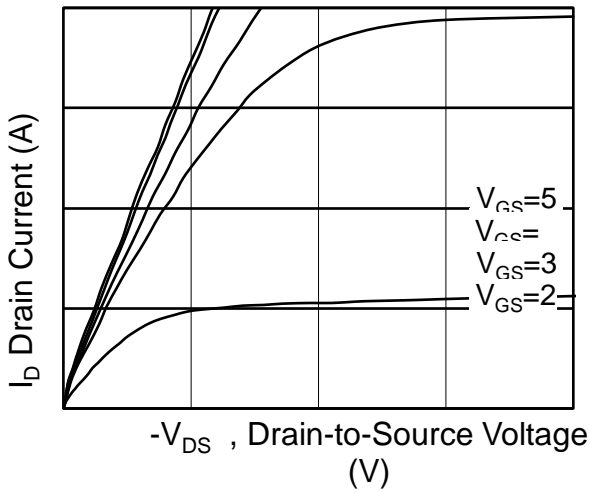


Fig.1 Typical Output Characteristics

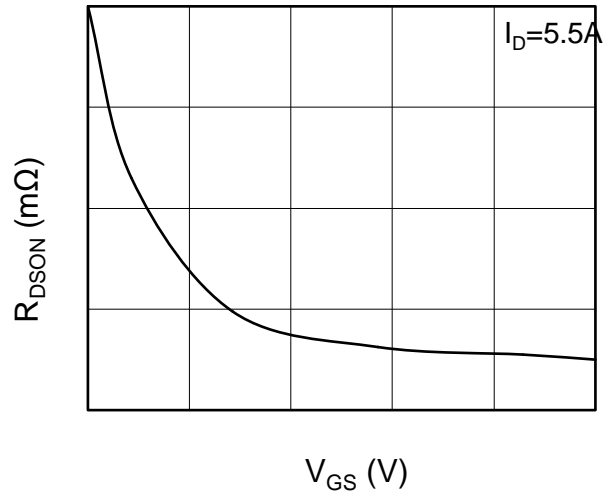


Fig.2 On-Resistance vs. G-S Voltage

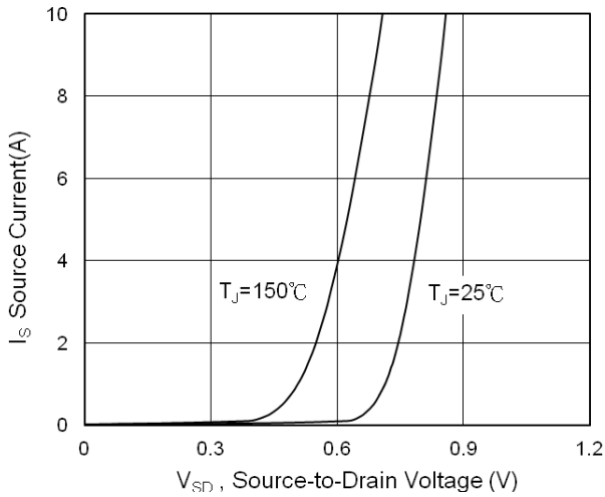


Fig.3 Forward Characteristics of Reverse

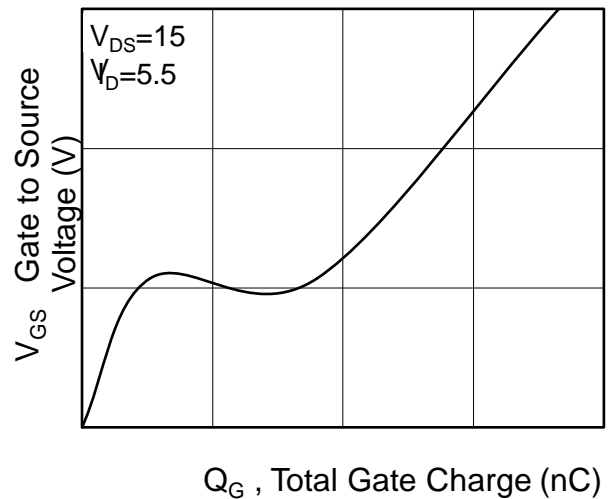


Fig.4 Gate-Charge Characteristics

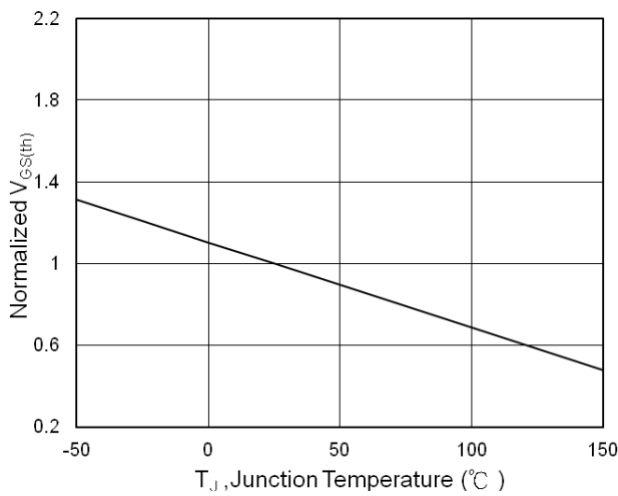


Fig.5 $V_{GS(th)}$ vs. T_J

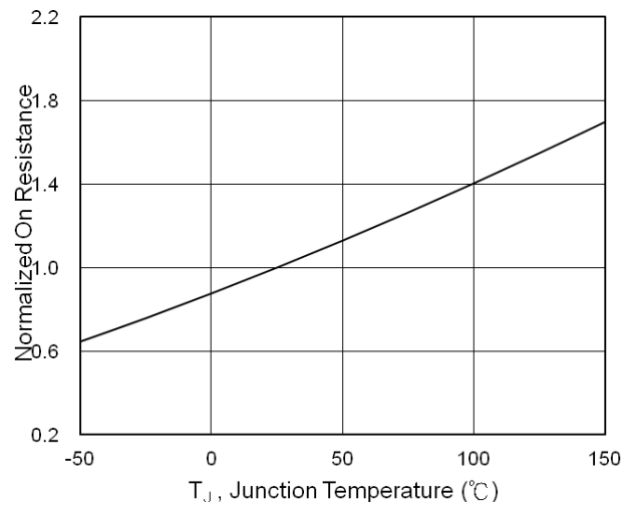


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

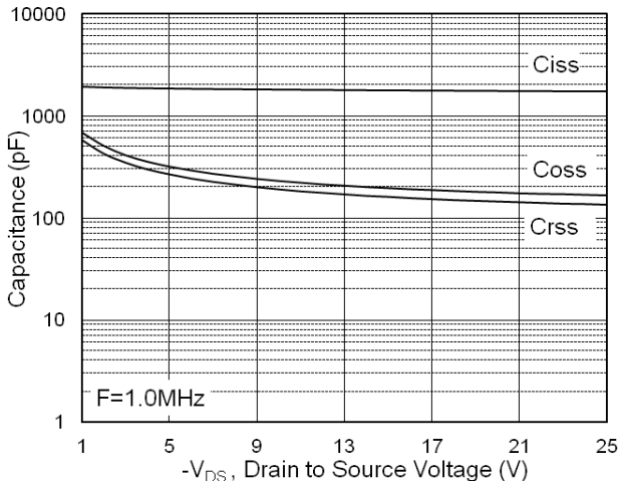


Fig.7 Capacitance

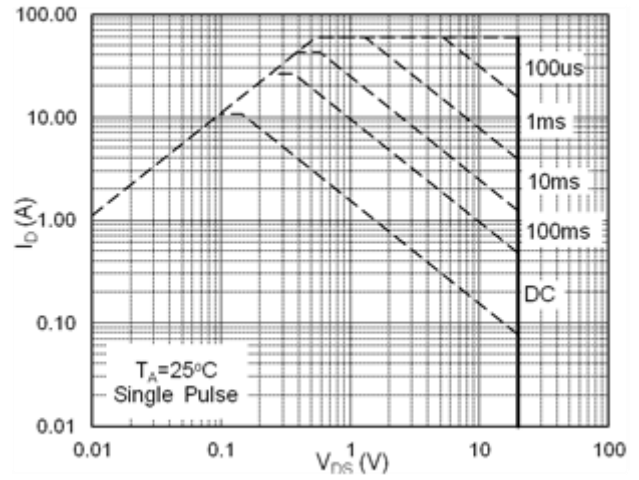


Fig.8 Safe Operating Area

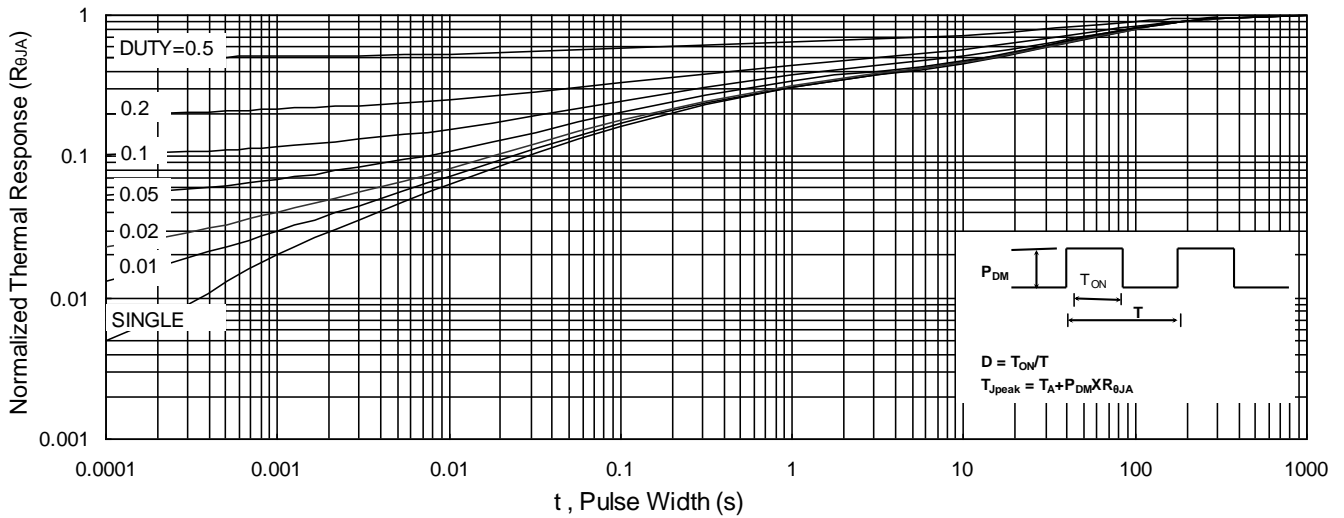


Fig.9 Normalized Maximum Transient Thermal Impedance

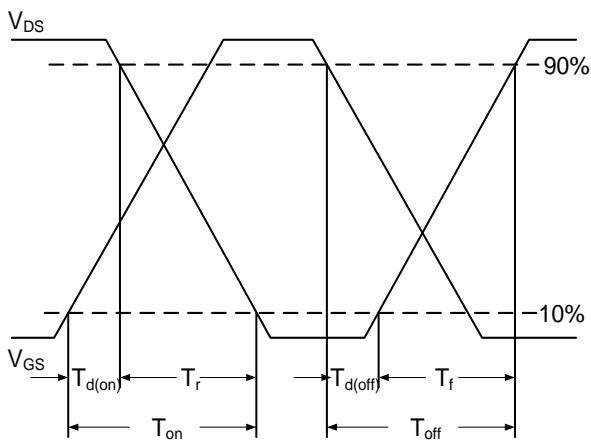


Fig.10 Switching Time Waveform

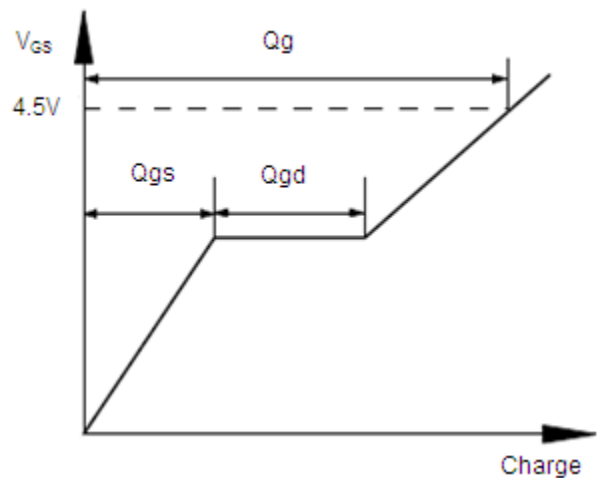
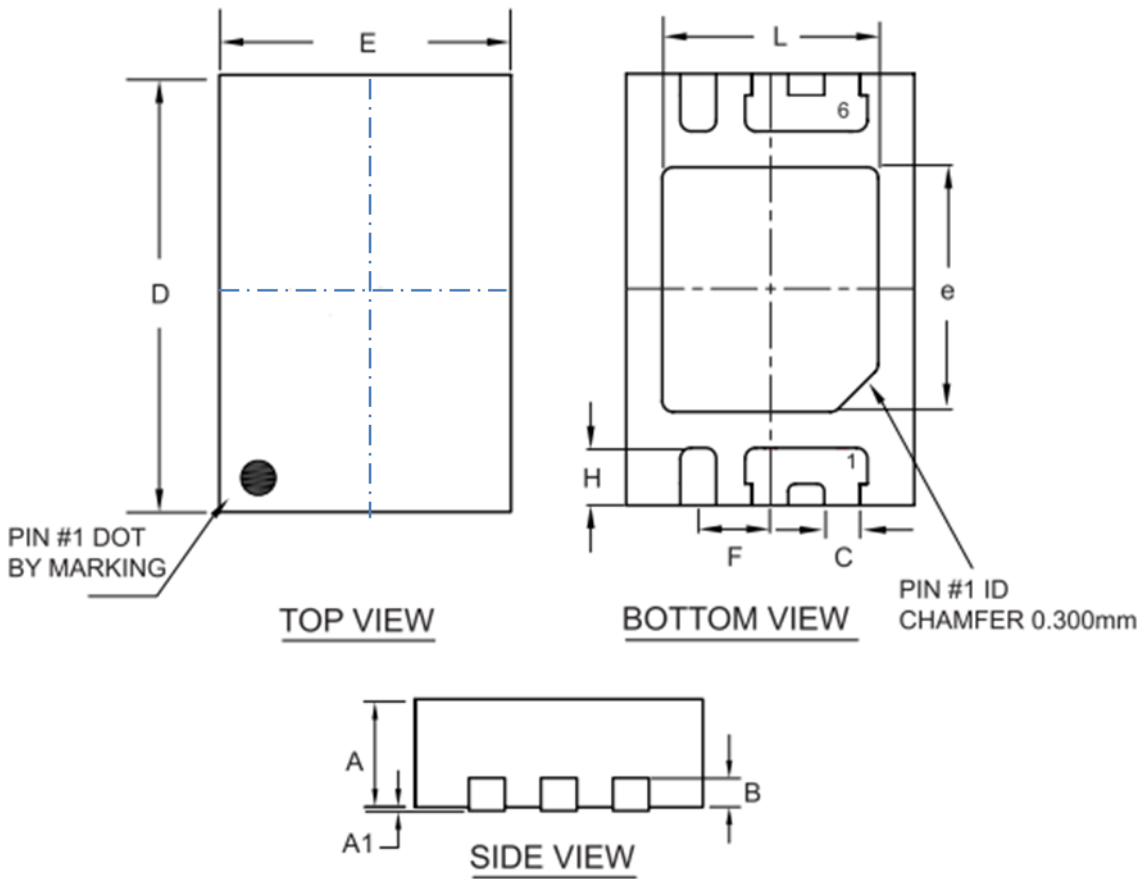


Fig.11 Gate Charge Waveform



DFN2x3 Package Outline Dimensions



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	0.0076	0.008
C	0.200	0.300	0.008	0.012
F	0.500 BSC		0.020 BSC	

Marking Instruction

