

General Description

The HSCA8220 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent $R_{DS(on)}$ and gate charge for most of the small power switching and load switch applications.

The HSCA8220 meet the RoHS and Green Product requirement with full function reliability approved.

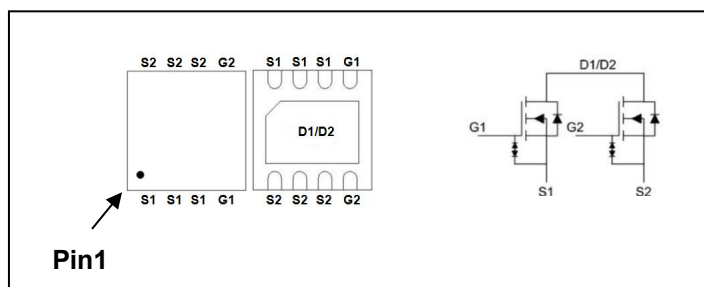
Features

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- ESD Protected
- Advanced high cell density Trench Technology

Product Summary

V_{DS}	18	V
$R_{DS(ON),typ}$	3.5	m Ω
I_D	22	A

DFN3x3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	18	V
V_{GS}	Gate-Source Voltage	± 10	V
$I_D@T_A=25^\circ C$	Continuous Drain Current ¹	22	A
$I_D@T_A=70^\circ C$	Continuous Drain Current ¹	16	A
I_{DM}	Pulsed Drain Current ²	80	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ¹	78	W
$P_D@T_A=70^\circ C$	Total Power Dissipation ¹	50	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 ($\leq 10s$)	1.6	---	$^\circ C/W$

Note :

1.Surface mounted on 1" x 1" FR4 board, $t \leq 10sec$

2.Pulse width limited by maximum junction temperature

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	$V_{GS}=0V$, $I_D=250\mu A$	18	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ¹	$V_{GS}=4.5V$, $I_D=8A$	---	3.5	4.5	m Ω
		$V_{GS}=3.5V$, $I_D=7A$	---	3.7	5.5	
		$V_{GS}=2.5V$, $I_D=6A$	---	4.3	6.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.4	0.7	1.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=18V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 10V$, $V_{DS}=0V$	---	---	± 10	μA
g_{fs}	Forward Transconductance ¹	$V_{DS}=5V$, $I_D=6A$	25	---	---	S
Q_g	Total Gate Charge	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=7A$	---	29	---	nC
Q_{gs}	Gate-Source Charge		---	4	---	
Q_{gd}	Gate-Drain Charge		---	7	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=3\Omega$, $I_D=2A$	---	16	---	ns
T_r	Rise Time		---	34	---	
$T_{d(off)}$	Turn-Off Delay Time		---	58	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2157	---	pF
C_{oss}	Output Capacitance		---	482	---	
C_{rss}	Reverse Transfer Capacitance		---	366	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=6A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

1. Pulse test: pulse width $\leq 300\mu s$, duty $\leq 2\%$

2. Guaranteed by design, not subject to production testing

Typical Characteristics

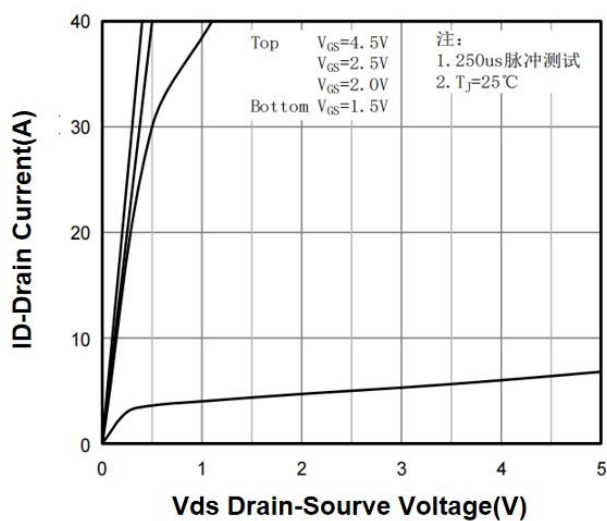


Fig.1 Output Characteristic

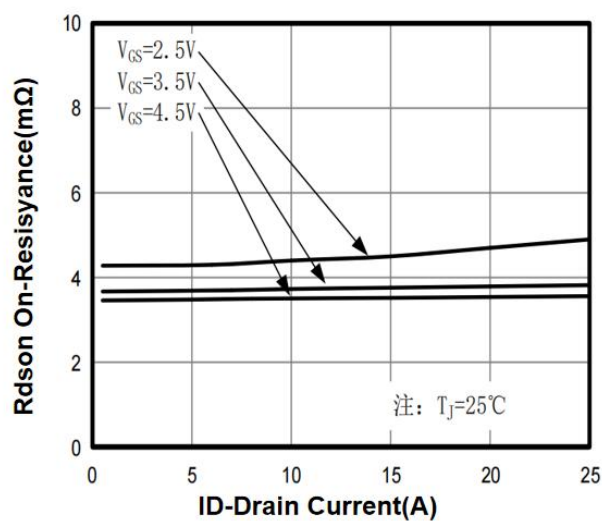


Fig.2 On-Resistance vs. Drain Current

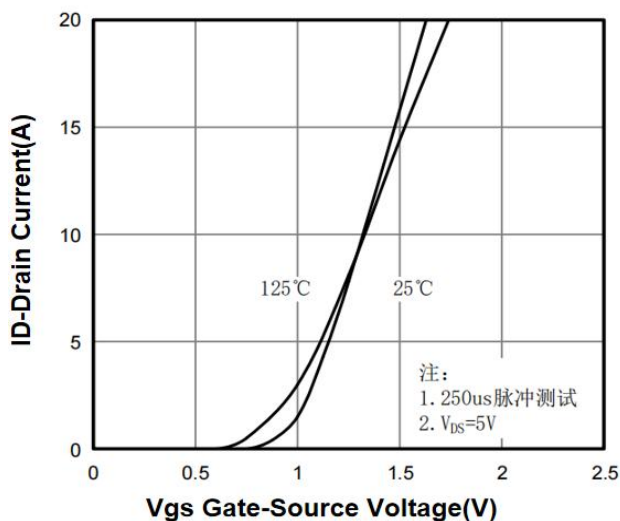


Fig.3 Transfer Characteristic

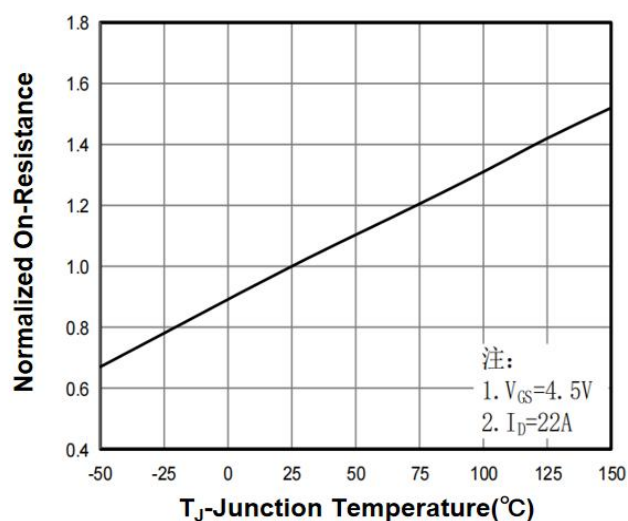


Fig.4 On-Resistance vs. Junction Temperature

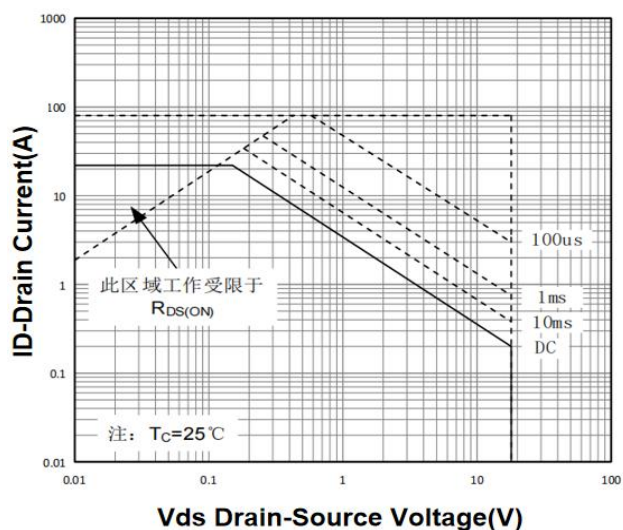


Fig.5 Safe Operation Area

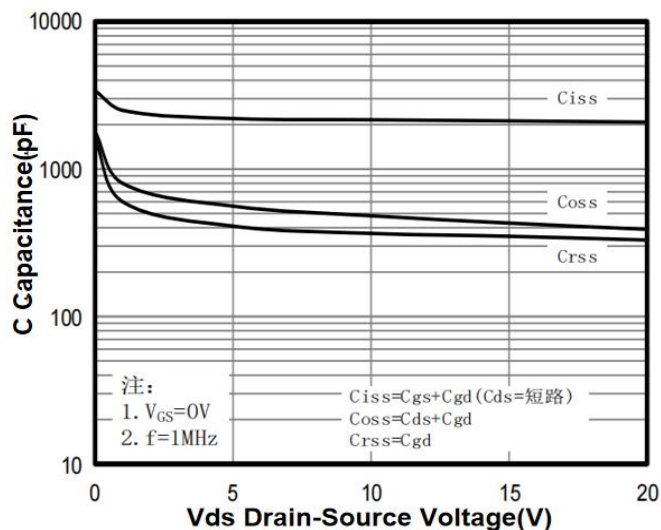


Fig.6 Capacitance Characteristic

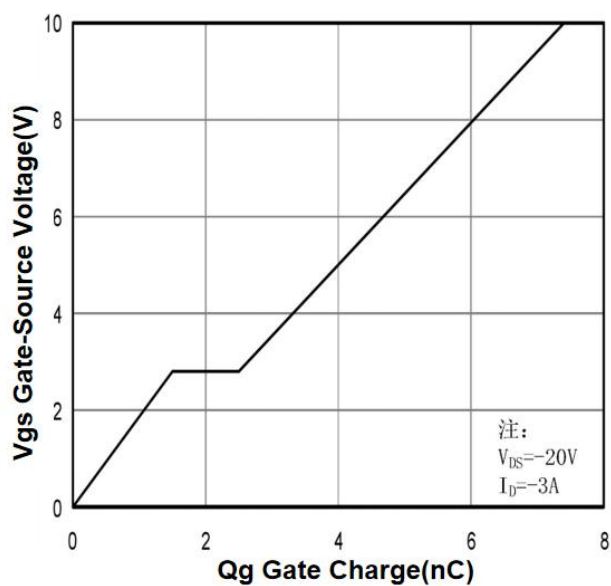


Fig.7 Gate-Charge Characteristic

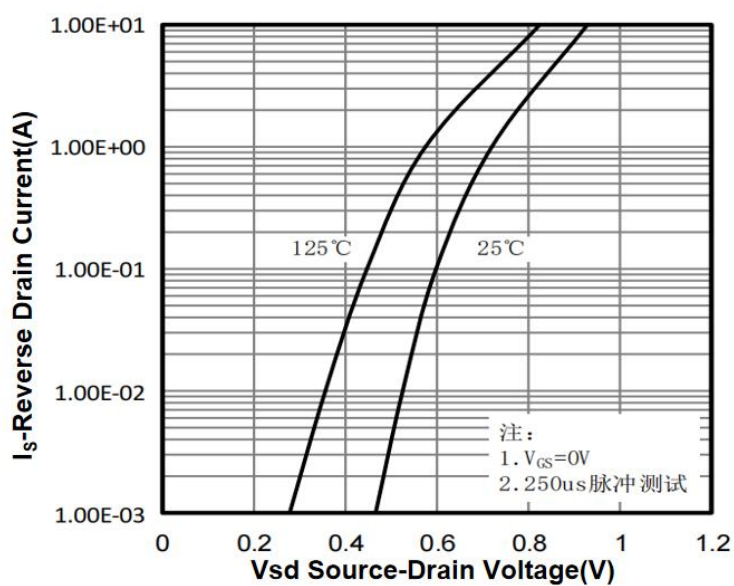
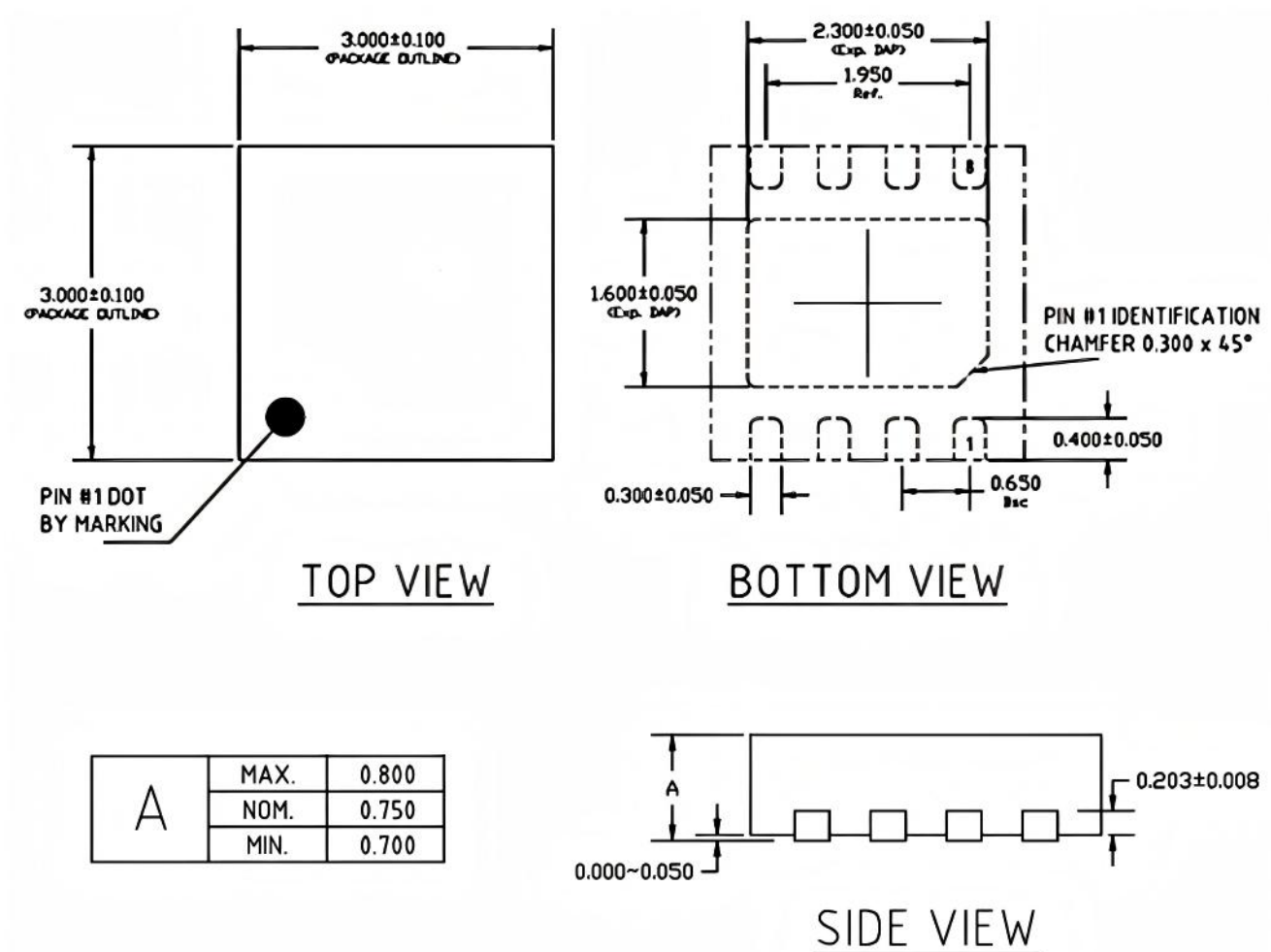


Fig.8 Body Diode Characteristic

Ordering Information

Part Number	Package code	Packaging
HSCA8220	DFN3x3	5000/Tape&Reel

DFN3x3 Package Outline



HSCA8220 Marking:

