HCNS1014

100V N-Channel MOSFET

General Description

These N-Channel enhancement mode power field effect transistors are using SGT 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.

Features

V_{DS}	100V
I_D (at V_{GS}=10V)	112A
$R_{DS(ON)}$ (at V_{GS}=10V)	3.3mΩ(Typ)

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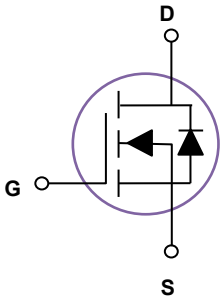


Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	TC=25°C	I_D	112	A
	TC=100°C	I_D	71	A
Maximum Power Dissipation		P_D	104	W
Single pulse avalanche energy(1)		E_{AS}	231	mJ
Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		1.2	℃ /W
Thermal Resistance unction-to-Ambient	$R_{\theta JA}$		65	℃ /W

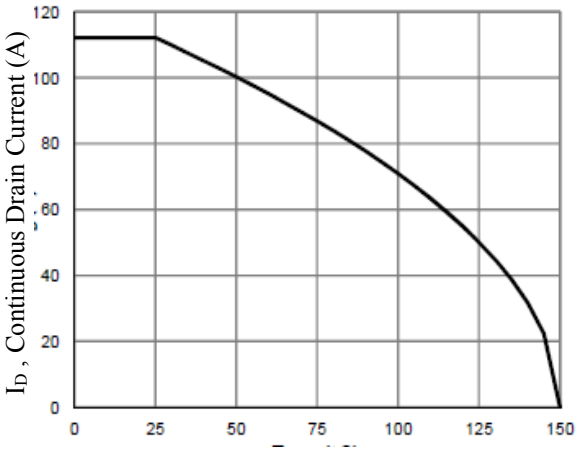
Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,V_{GS}=0V			1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	3.0	4.0	V
$R_{DS(ON)}$	Drain-Source On-State esistance	V_{GS}=10V, I_D=20A		3.3	4.2	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V , F=1.0MHz		3434		pF
C_{oss}	Output Capacitance			906		pF
C_{rss}	Reverse Transfer Capacitance			14		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=40V,I_D=1A, V_{GS}=10V, R_G=6Ω		15		nS
t_r	Turn-on Rise Time			34		nS
$t_{d(off)}$	Turn-Off Delay Time			60		nS
t_f	Turn-Off Fall Time			50		nS
Q_g	Total Gate Charge	V_{DS}=40V,I_D=10A, V_{GS}=10V		57		nC
Q_{gs}	Gate-Source Charge			11		nC
Q_{gd}	Gate-Drain Charge			16		nC
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=1A		0.72	1.4	V

Note：

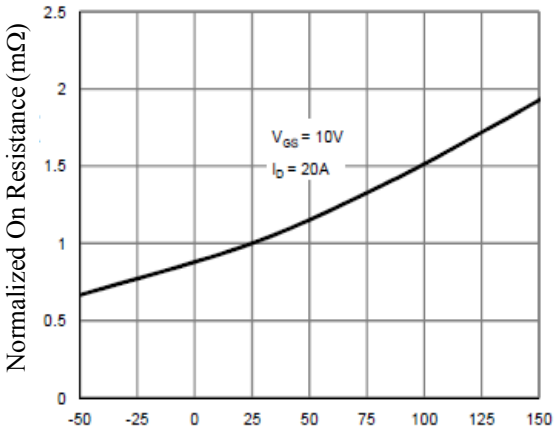
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V,V_{GS}=10V,L=0.1mH,IAS=60A, Starting TJ=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



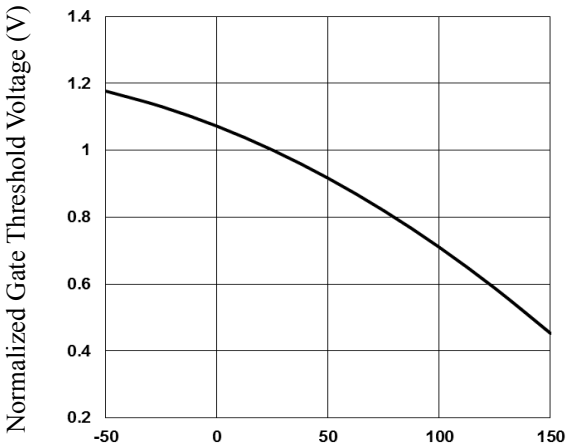
T_C , Case Temperature (℃)

Fig.1 Continuous Drain Current vs. T_C



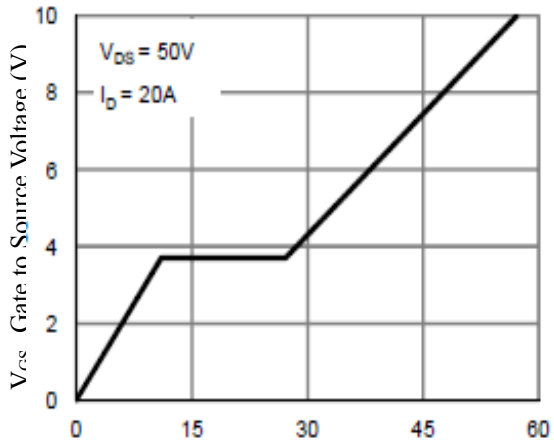
T_J , Junction Temperature (℃)

Fig.2 Normalized RDSON vs. T_J



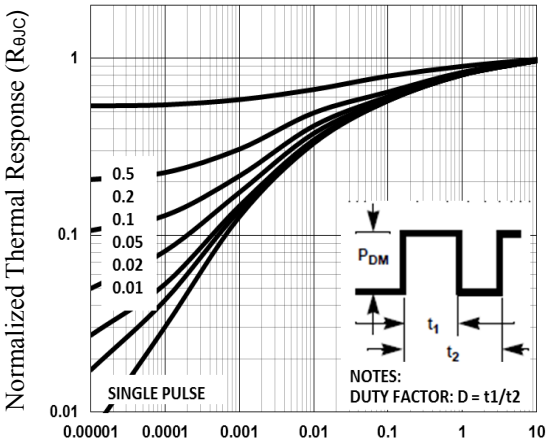
T_J , Junction Temperature (℃)

Fig.3 Normalized Vth vs. T_J



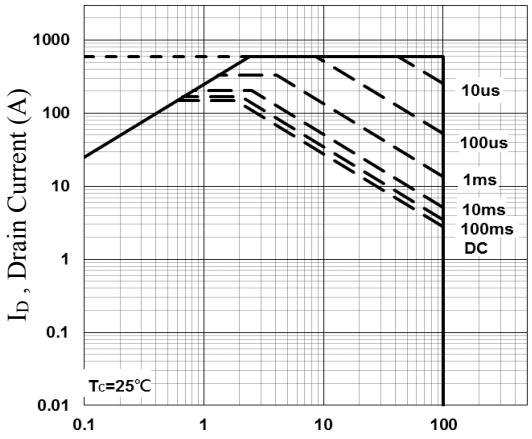
Qg , Gate Charge (nC)

Fig.4 Gate Charge Characteristics



Square Wave Pulse Duration (s)

Fig.5 Normalized Transient Impedance



V_{DS} , Drain to Source Voltage (V)

Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

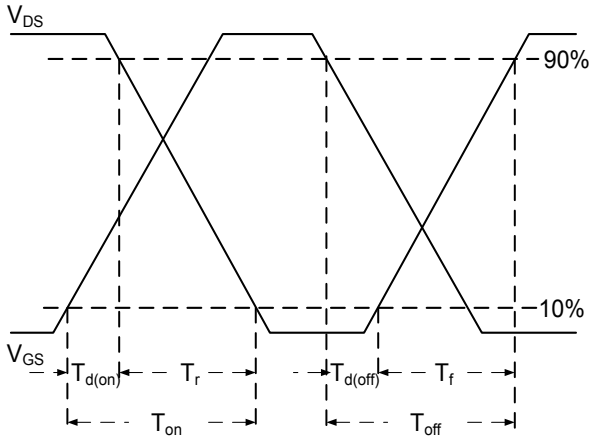


Fig.7 Switching Time Waveform

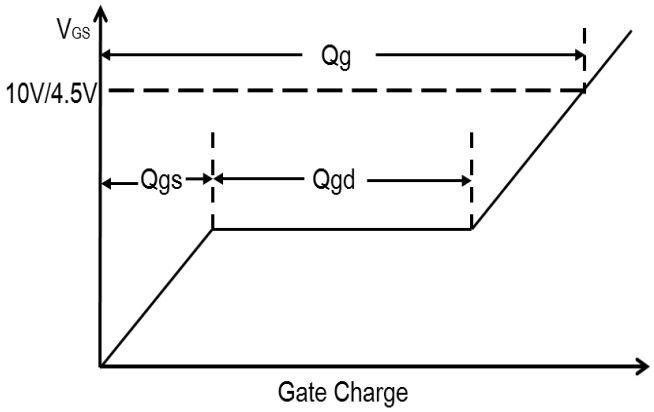
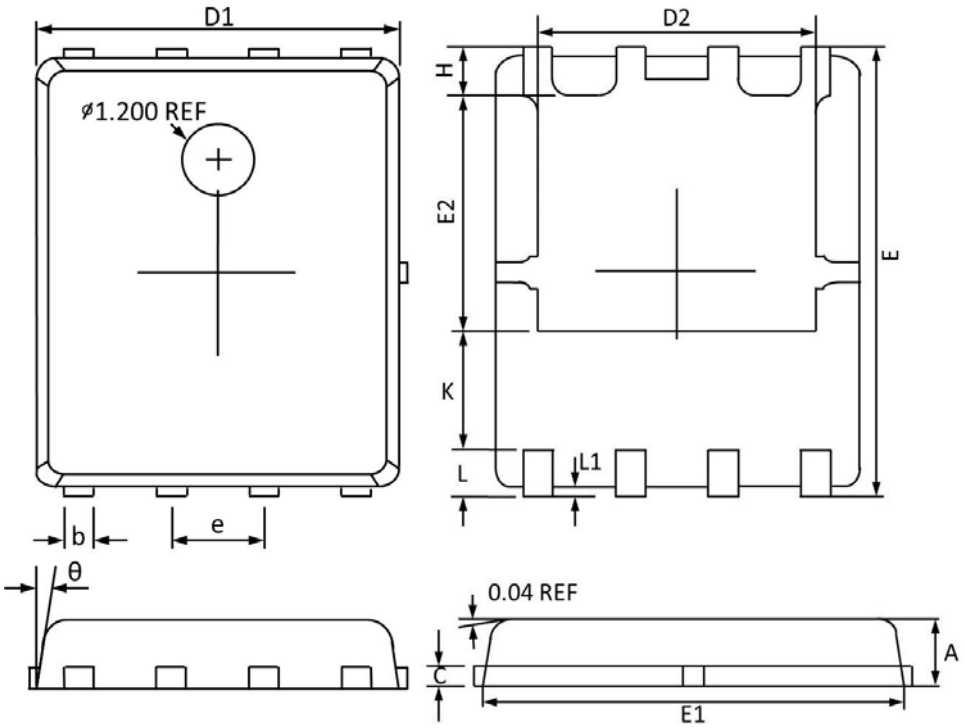


Fig.8 Gate Charge Waveform

PDFN5*6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°