杭芯科技
HUTCHIP

HCNS1006

100V N-Channel MOSFET

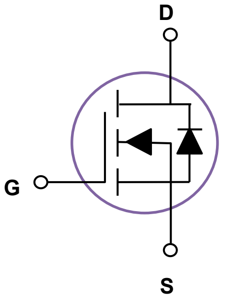
General Description

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)	100A
$R_{DS(ON)}$ (at V_{GS}=10V)	5.3mΩ(Typ)

PDFN5x6



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	100	A
	TC=100°C	I_D	60	A
Maximum Power Dissipation		P_D	130	W
Single pulse avalanche energy$^{(1)}$		E_{AS}	220	mJ
Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		1.1	℃ /W
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	℃ /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}=100V,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 Resistance	V_{GS}=10V, I_D=20A		5.3	6.5	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, F=1.0MHz		2370		pF
C_{oss}	Output Capacitance			540		pF
C_{rss}	Reverse Transfer Capacitance			12		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,I_D=1A, V_{GS}=10V, R_G=6Ω		13		nS
t_r	Turn-on Rise Time			29		nS
$t_{d(off)}$	Turn-Off Delay Time			40		nS
t_f	Turn-Off Fall Time			44		nS
Q_g	Total Gate Charge	V_{DS}=50V,I_D=20A, V_{GS}=10V		38		nC
Q_{gs}	Gate-Source Charge			8.0		nC
Q_{gd}	Gate-Drain Charge			9.0		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}=25V,V_{GS}=10V,L=0.5mH,IAS=50A., 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

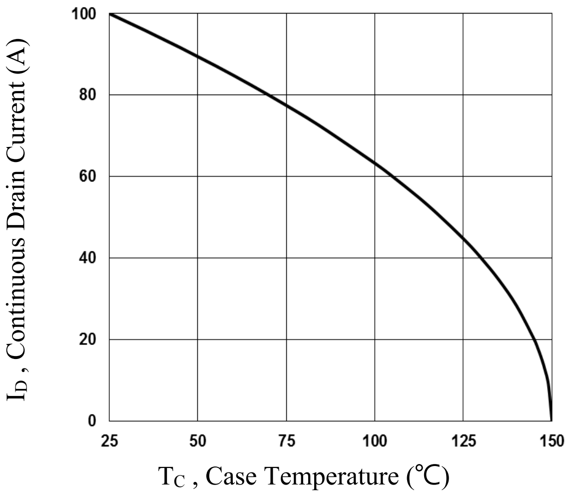


Fig.1 Continuous Drain Current vs. T_C

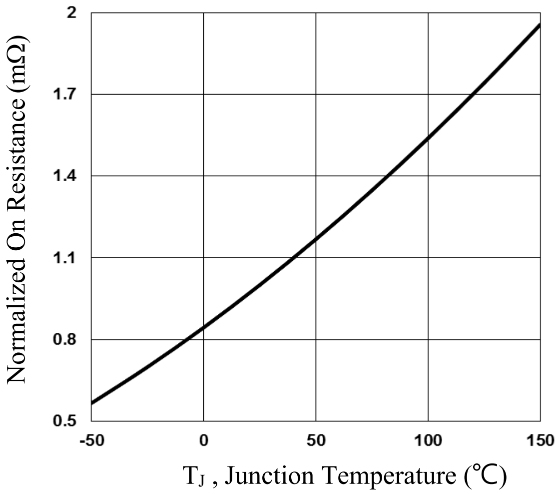


Fig.2 Normalized RDSON vs. T_J

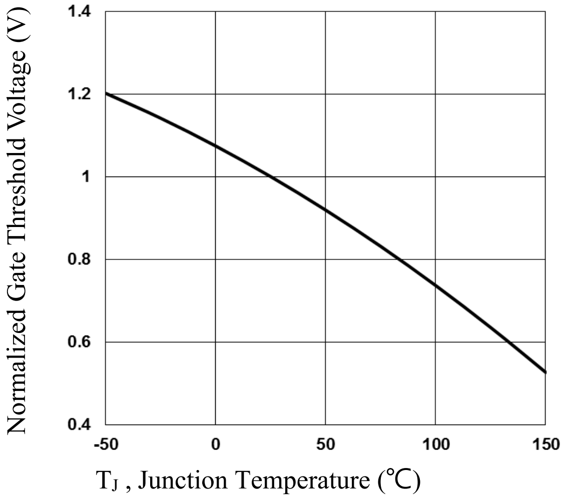


Fig.3 Normalized Vth vs. T_J

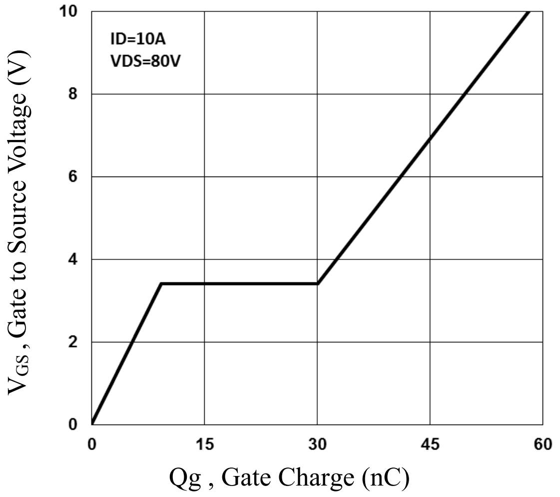


Fig.4 Gate Charge Characteristics

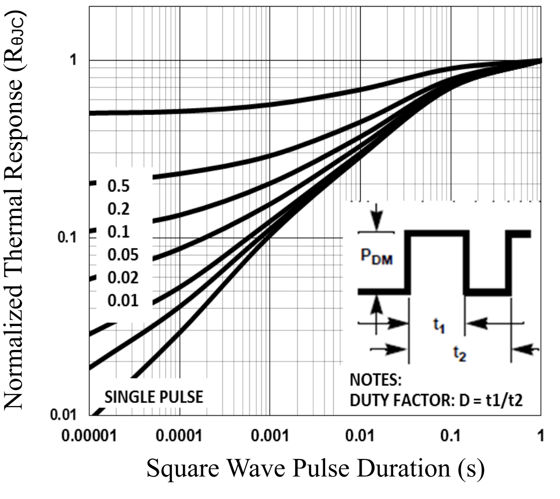


Fig.5 Normalized Transient Impedance

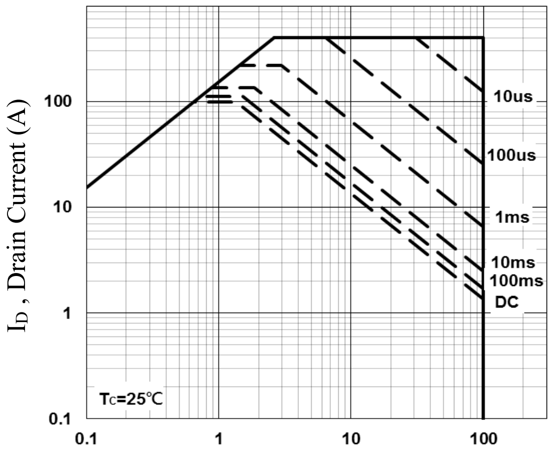


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

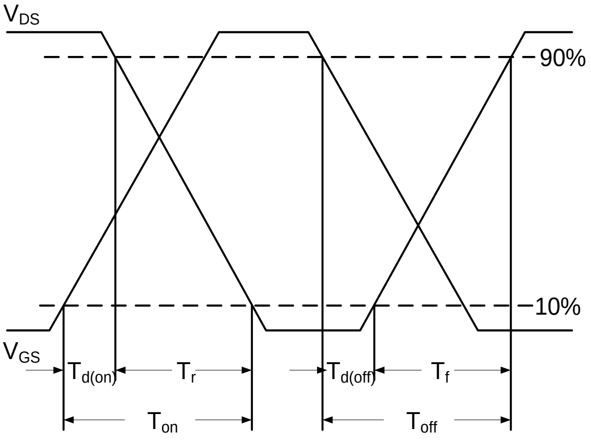


Fig.7 Switching Time Waveform

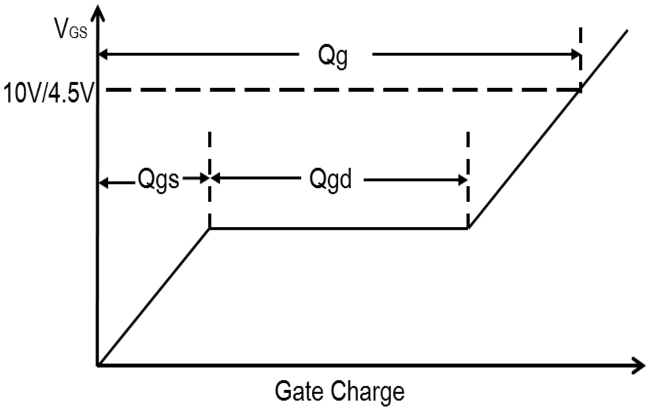
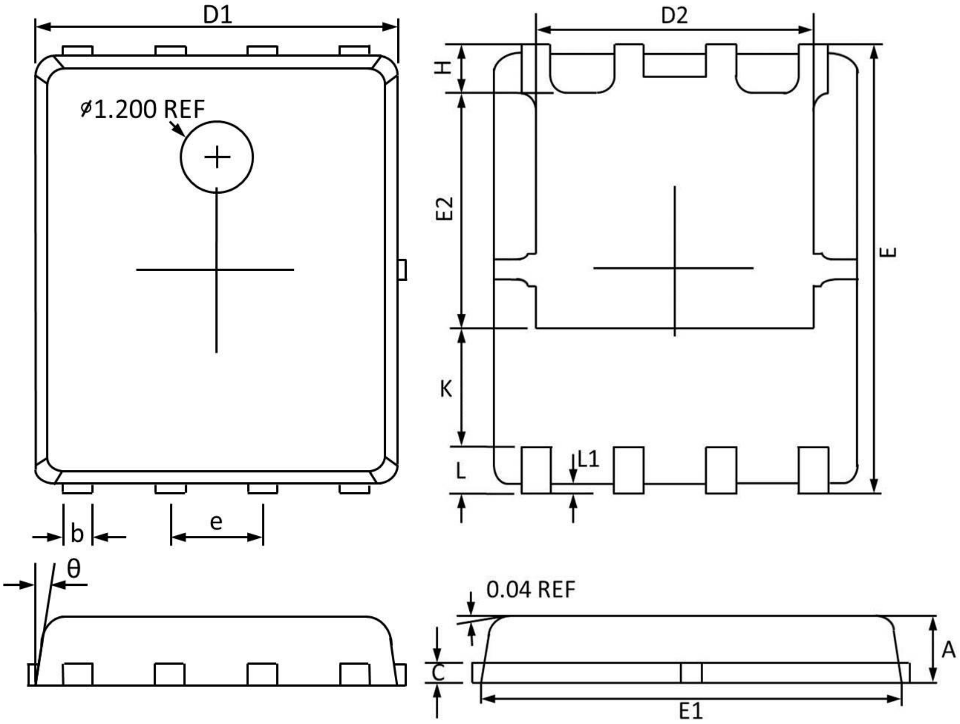


Fig.8 Gate Charge Waveform

PDFN5x6 PACKAGE INFORMATION



<table>
<tr><th rowspan="2">Symbol</th><th colspan="2">Dimensions In Millimeters</th><th colspan="2">Dimensions In Inches</th></tr>
<tr><th>MAX</th><th>MIN</th><th>MAX</th><th>MIN</th></tr>
<tr><td>A</td><td>1.100</td><td>0.800</td><td>0.043</td><td>0.031</td></tr>
<tr><td>b</td><td>0.510</td><td>0.330</td><td>0.020</td><td>0.013</td></tr>
<tr><td>C</td><td>0.300</td><td>0.200</td><td>0.012</td><td>0.008</td></tr>
<tr><td>D1</td><td>5.100</td><td>4.800</td><td>0.201</td><td>0.189</td></tr>
<tr><td>D2</td><td>4.100</td><td>3.610</td><td>0.161</td><td>0.142</td></tr>
<tr><td>E</td><td>6.200</td><td>5.900</td><td>0.244</td><td>0.232</td></tr>
<tr><td>E1</td><td>5.900</td><td>5.700</td><td>0.232</td><td>0.224</td></tr>
<tr><td>E2</td><td>3.780</td><td>3.350</td><td>0.149</td><td>0.132</td></tr>
<tr><td>e</td><td colspan="2">1.27BSC</td><td colspan="2">0.05BSC</td></tr>
<tr><td>H</td><td>0.700</td><td>0.410</td><td>0.028</td><td>0.016</td></tr>
<tr><td>K</td><td>1.500</td><td>1.100</td><td>0.059</td><td>0.043</td></tr>
<tr><td>L</td><td>0.710</td><td>0.510</td><td>0.028</td><td>0.020</td></tr>
<tr><td>L1</td><td>0.200</td><td>0.060</td><td>0.008</td><td>0.002</td></tr>
<tr><td>θ</td><td>12°</td><td>0°</td><td>12°</td><td>0°</td></tr>
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