

General Description

- 100% UIS Tested
- Advanced SGT MOS Technology
- Low Gate Charge
- High Current Capability
- RoHS and Halogen-Free Compliant

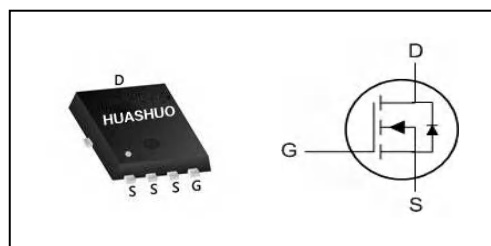
Product Summary

V_{DS}	40	V
$R_{DS(ON),TYP}$	0.75	m Ω
I_D	255	A

Applications

- SMPS Synchronous Rectification
- DC/DC Converters
- ORING
- UAV ESC

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	260	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	160	A
I_{DM}	Pulsed Drain Current	1020	A
EAS	Single Pulse Avalanche Energy ⁵	401	mJ
I_{AS}	Avalanche Current	50	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	200	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 ³	---	50	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.88	$^{\circ}C/W$



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	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=50A$	---	0.75	0.9	$m\Omega$
		$V_{GS}=4.5V, I_D=50A$	---	1.05	1.2	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.1	1.5	2.4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2.5	---	Ω
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=115A$	---	70	---	S
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=20A$	---	125	---	nC
Q_{gs}	Gate-Source Charge		---	29	---	
Q_{gd}	Gate-Drain Charge		---	32	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=1.6\Omega, I_D=20A$	---	30	---	ns
T_r	Rise Time		---	42	---	
$T_{d(off)}$	Turn-Off Delay Time		---	80	---	
T_f	Fall Time	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	31	---	pF
C_{iss}	Input Capacitance		---	6309	---	
C_{oss}	Output Capacitance		---	2622	---	
C_{rss}	Reverse Transfer Capacitance		---	152	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ²	$V_G=V_D=0V$, Force Current	---	---	255	A
V_{SD}	Diode Forward Voltage ³	$V_{GS}=0V, I_S=115A, T_J=25^{\circ}\text{C}$	---	---	1.2	V
T_{rr}	Reverse Recovery Time	$T_J=25^{\circ}\text{C}, I_F=20A, di/dt=100A/\mu s$	---	99	---	ns
Q_{rr}	Reverse Recovery Charge		---	62	---	nC

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production.
5. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=32V, V_G=10V, L=0.5mH, R_g=25\Omega$.



Typical Characteristics

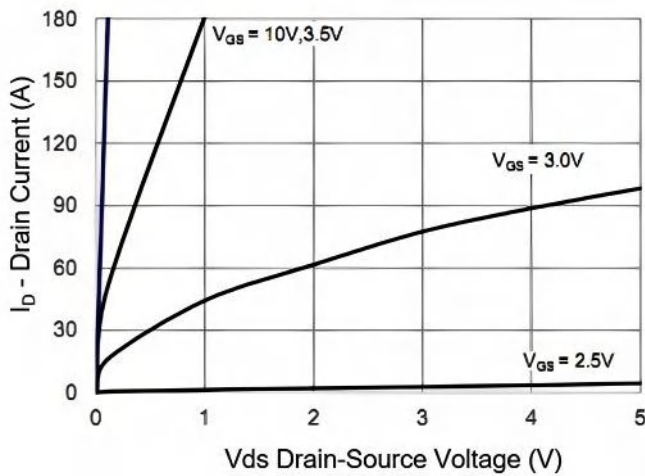


Fig.1 Typical Output Characteristics

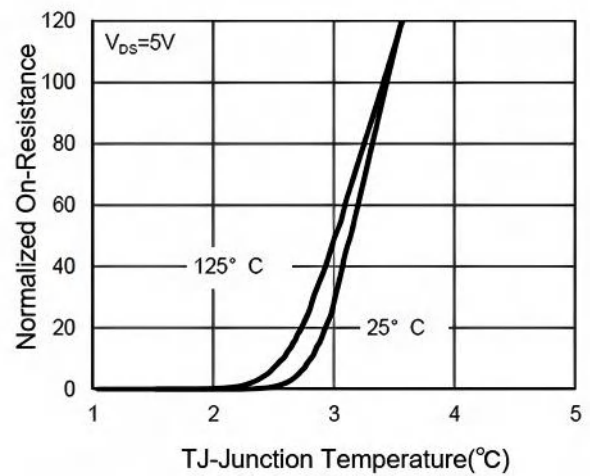


Fig.2 Transfer Characteristics

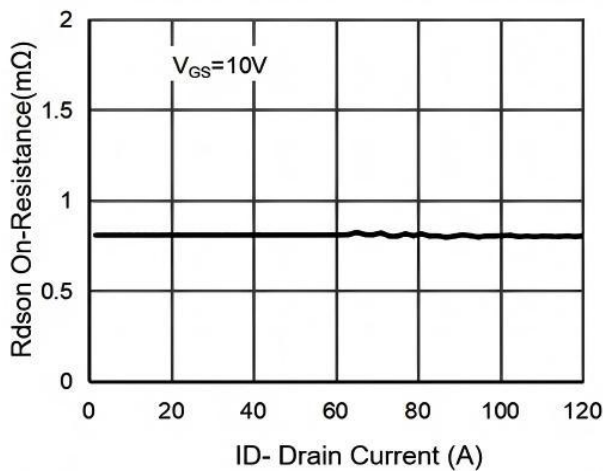


Fig.3 Rdson-Drain Current

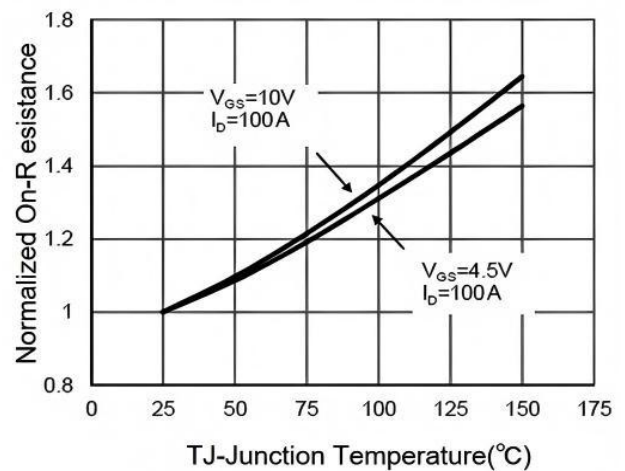


Fig.4 Rdson-Junction Temperature

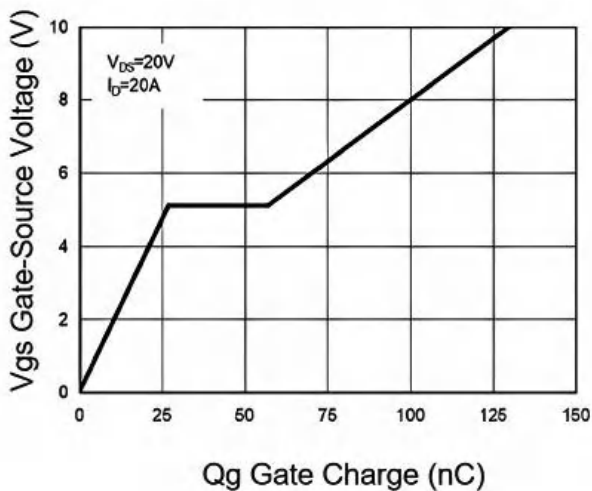


Fig.5 Gate Charge

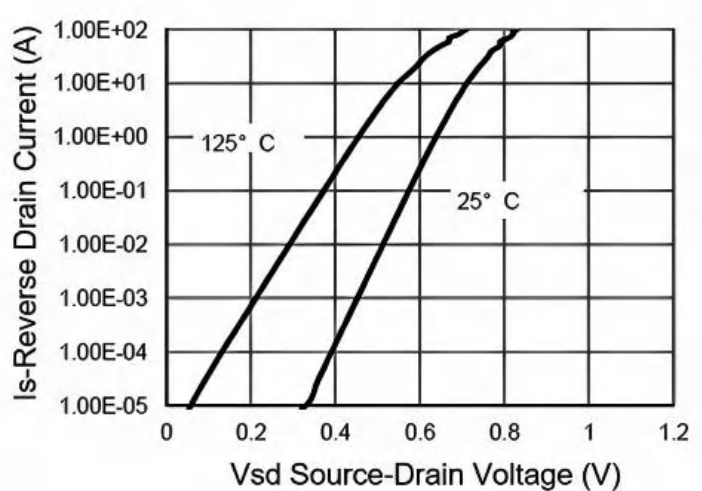


Fig.6 Source-Drain Diode Forward

N-Ch 40V Fast Switching MOSFETs

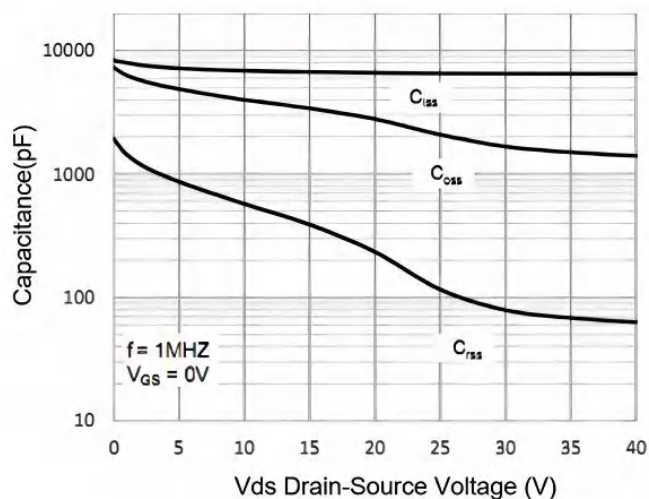


Fig.7 Capacitance vs Vds

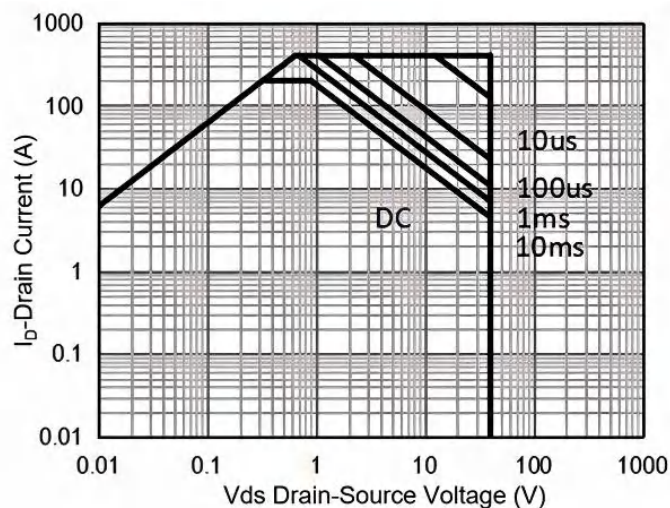


Fig.8 Safe Operating Area

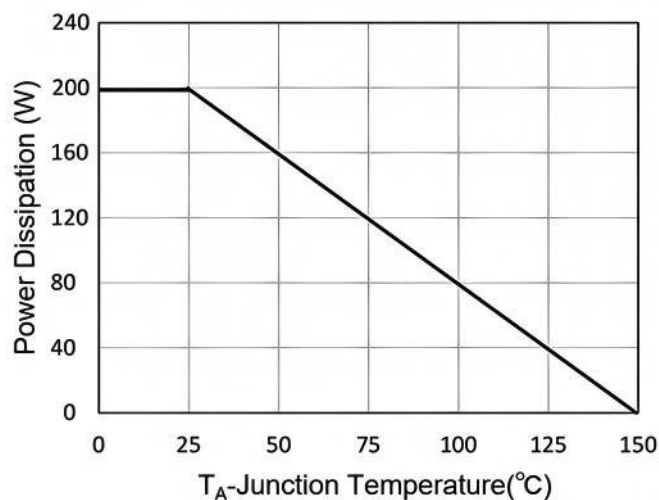


Fig.9 Power De-Rating

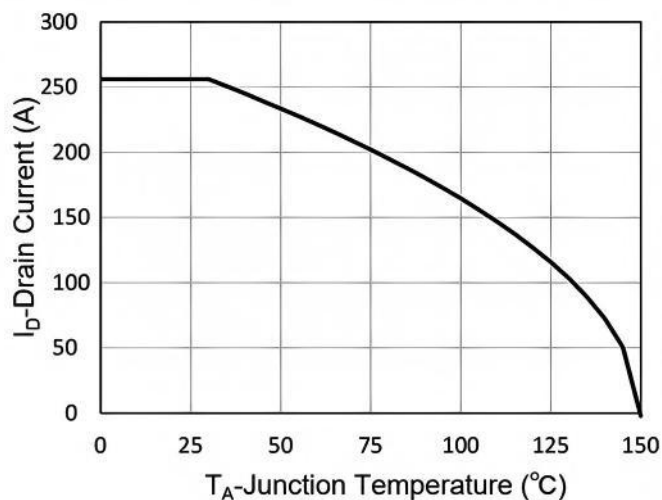


Fig.10 Current De-Rating

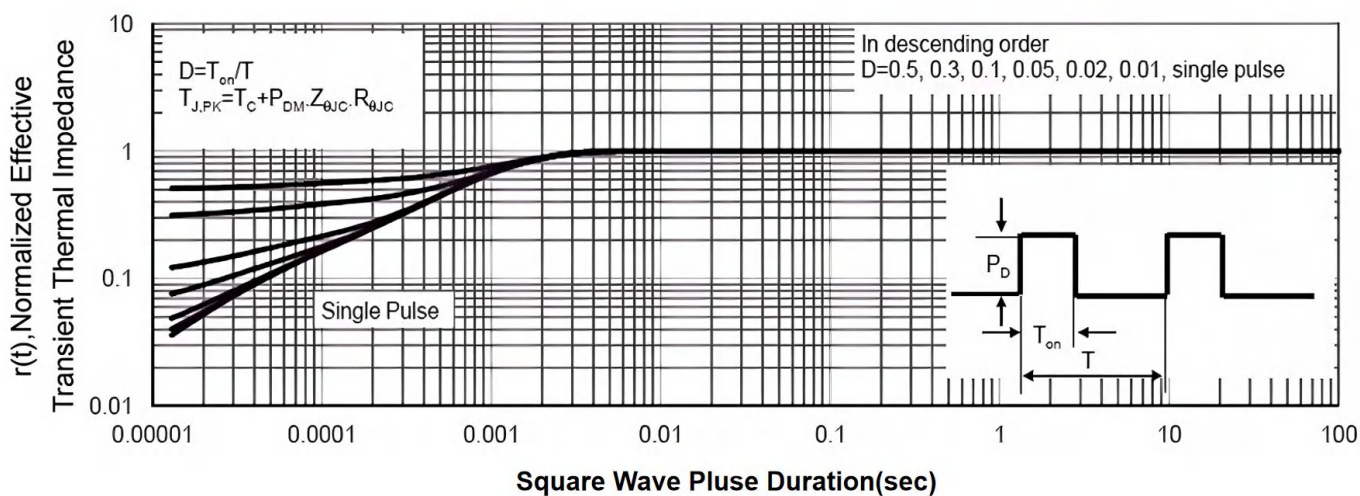
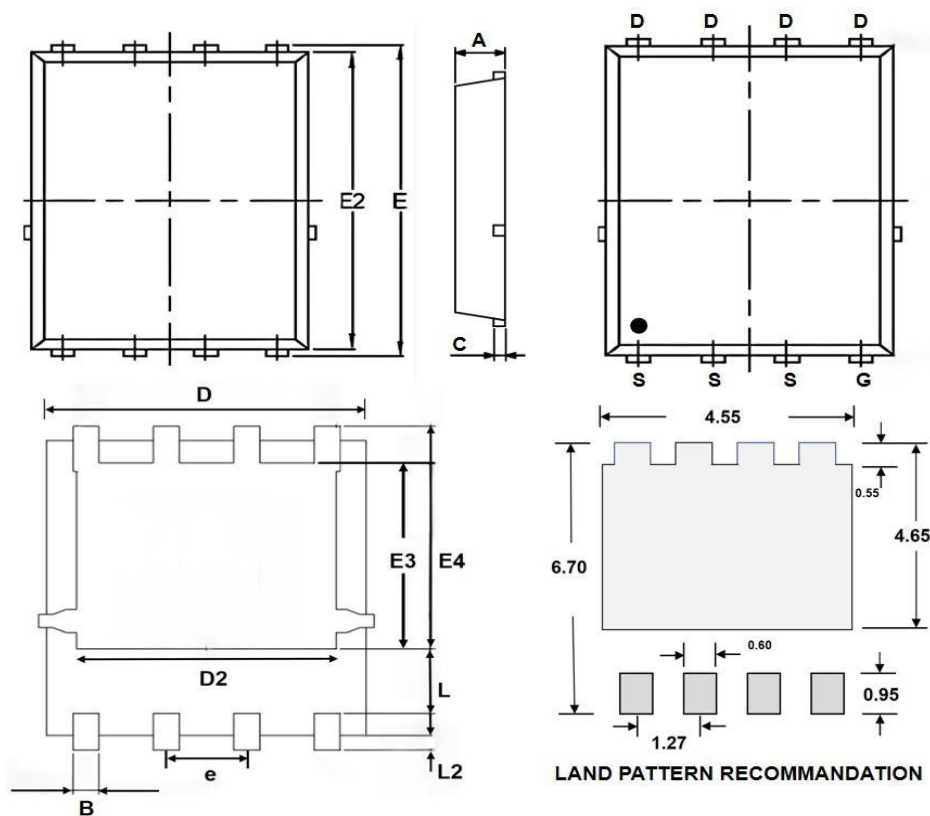


Figure.11 Normalized Maximum Transient Thermal Impedance

Ordering Information

Part Number	Package code	Packaging
HSBA075N04	PRPAK5*6	3000/Tape&Reel

PRPAK5*6 Package Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.25	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.45	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	6.06	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

HSBA075N04 Marking:

