

**General Description**

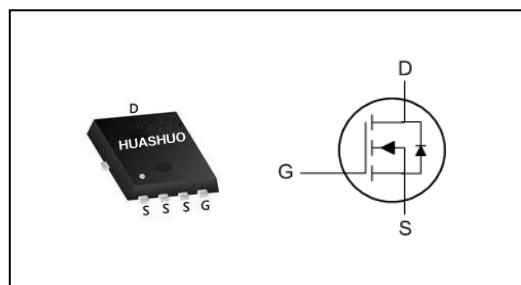
- 100% UIS Tested
- Super Trench Technology
- Surface-mounted package
- MSL1
- $T_j$  max 175°C

**Applications**

- Motor drivers
- DC/DC Converters

**Product Summary**

$V_{DS}$	30	V
$R_{DS(ON),MAX}$	0.5	mΩ
$I_D$	197	A

**PRPAK5X6 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1,6</sup>	197	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	788	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	420	mJ
$I_S$	Avalanche Current	197	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	35	W
$T_{STG}$	Storage Temperature Range	-55 to 175	°C
$T_J$	Operating Junction Temperature Range	-55 to 175	°C

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	3.5	°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	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=50A$	---	0.45	0.5	m $\Omega$
		$V_{GS}=4.5V, I_D=30A$	---	0.75	0.85	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	---	2	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	30	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_D=50A$	---	142	---	nC
$Q_{gs}$	Gate-Source Charge		---	26	---	
$Q_{gd}$	Gate-Drain Charge		---	27	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_G=4.5\Omega, R_L=0.3\Omega, I_D=50A$	---	12.3	---	ns
$T_r$	Rise Time		---	92	---	
$T_{d(off)}$	Turn-Off Delay Time		---	158	---	
$T_f$	Fall Time		---	119	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	8080	---	pF
$C_{oss}$	Output Capacitance		---	3466	---	
$C_{riss}$	Reverse Transfer Capacitance		---	236	---	

**Diode Characteristics**

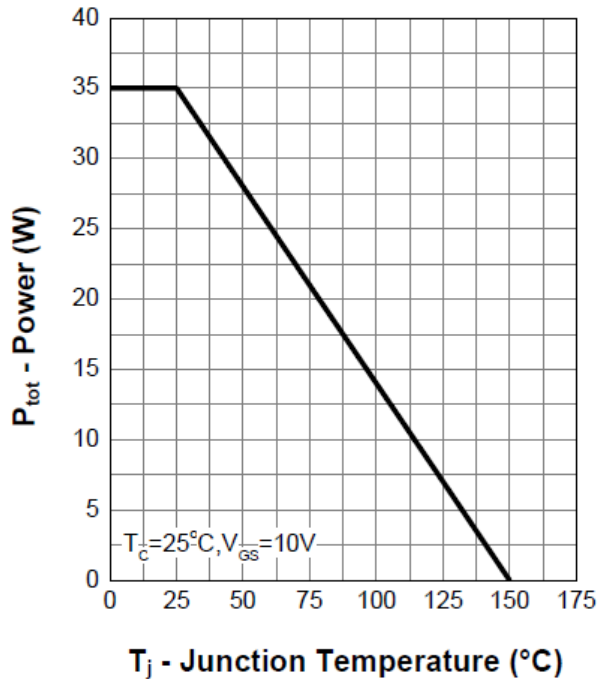
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse Recovery Time	$I_{sd}=30A, dI_{sd}/dt=100A/\mu s$	---	83	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	113	---	nC
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=50A, T_J=25^\circ\text{C}$	---	---	1.3	V

Note :

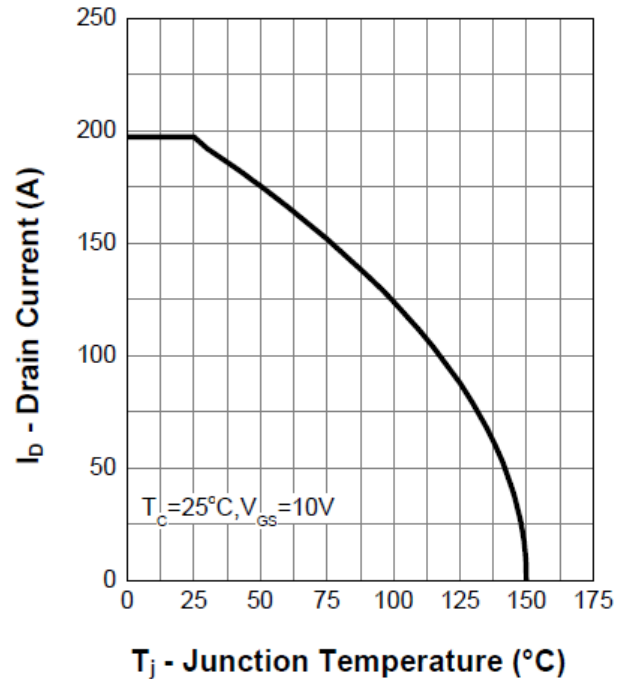
- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ\text{C}$  junction temperature
- 4.The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

**Typical Characteristics**

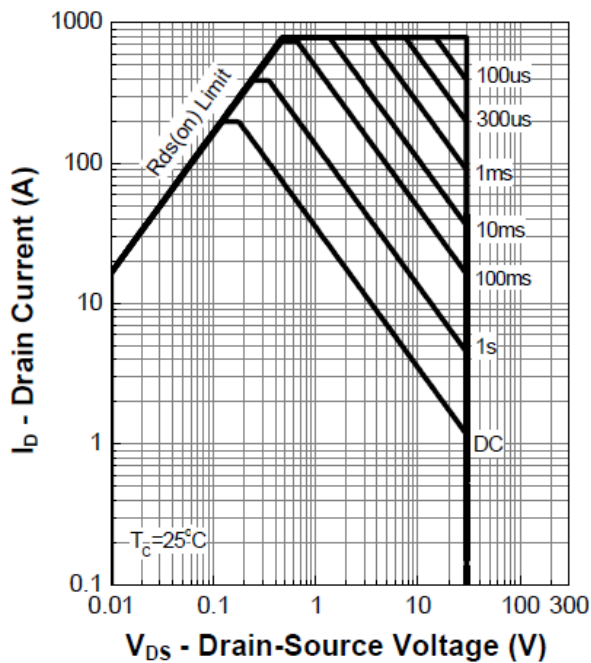
**Power Capability**



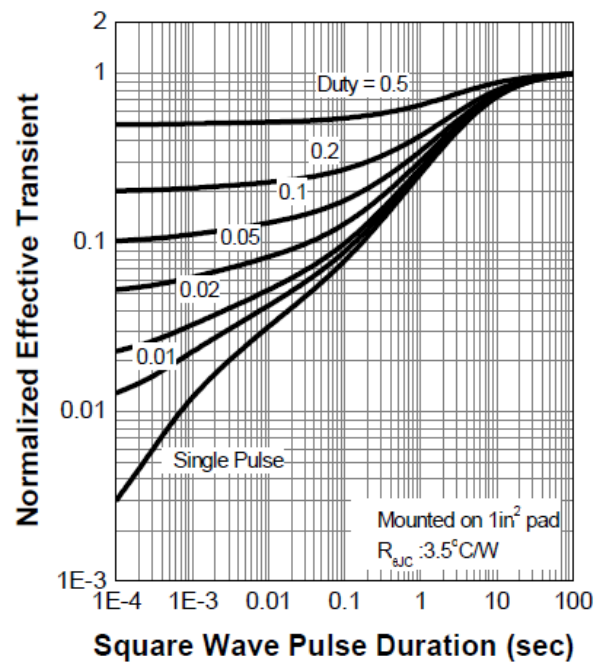
**Current Capability**



**Safe Operation Area**

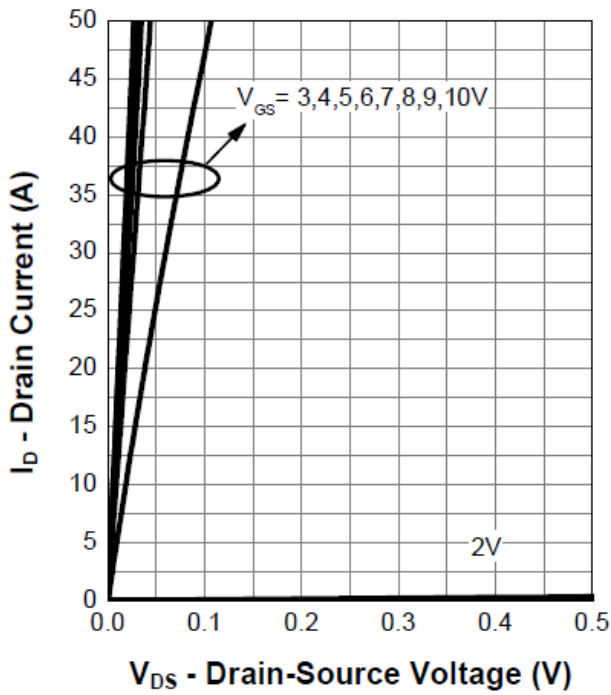


**Transient Thermal Impedance**

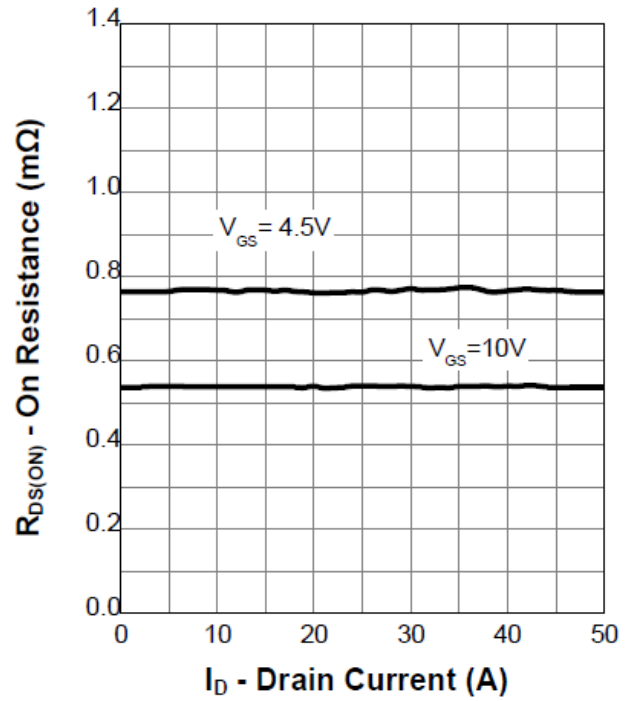




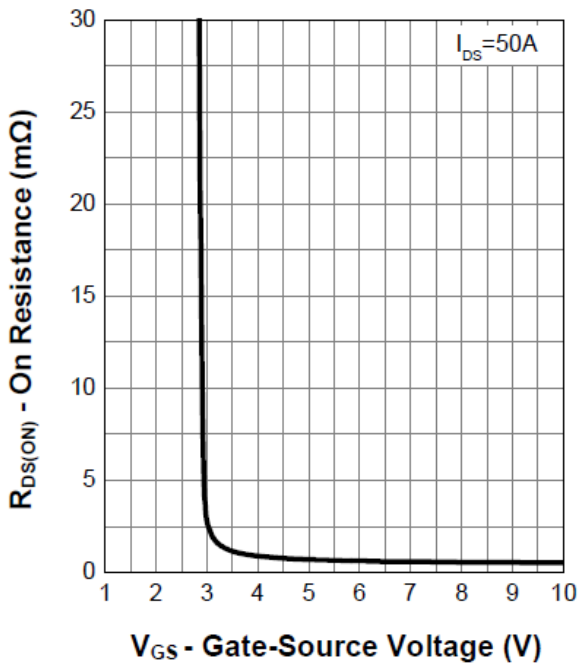
**Output Characteristics**



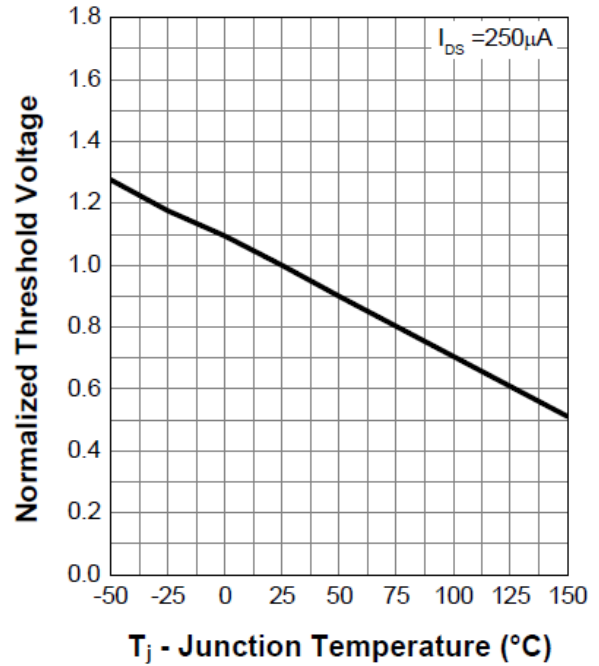
**On Resistance**

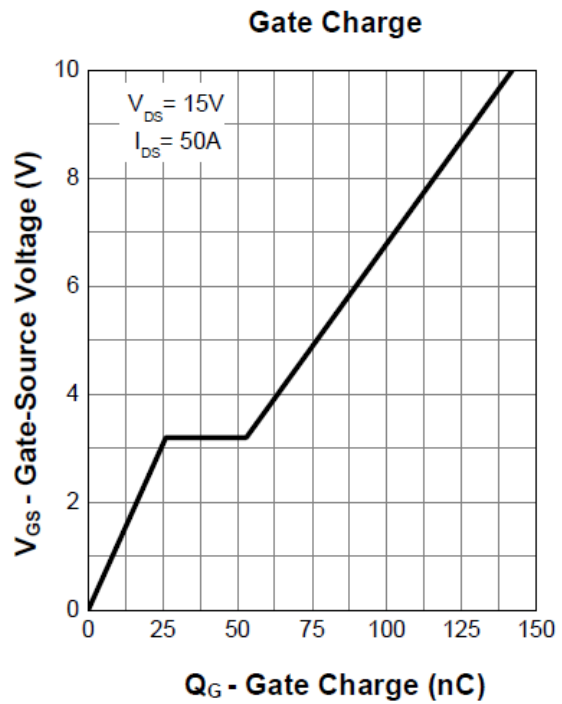
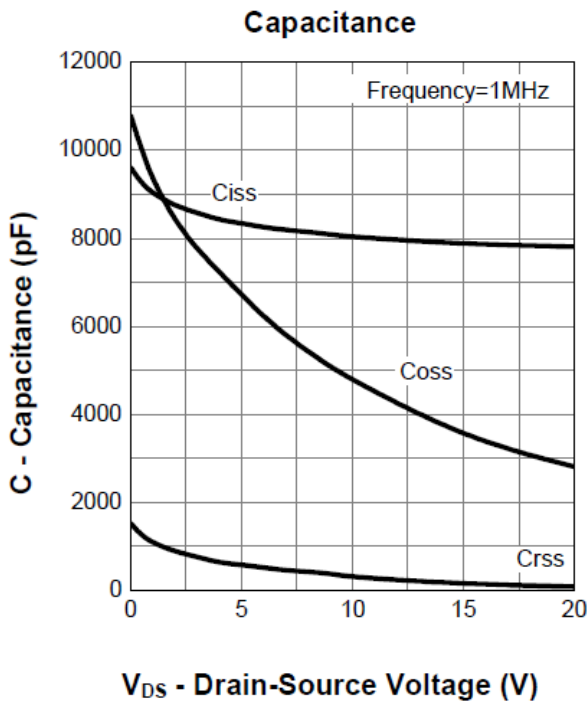
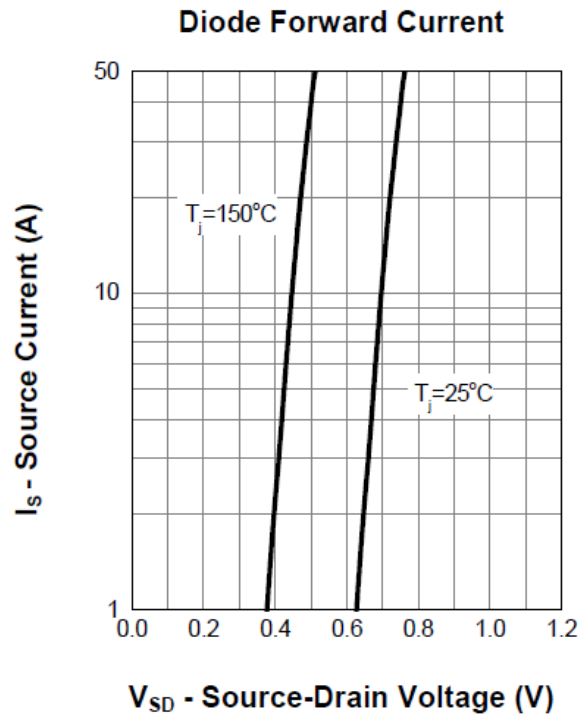
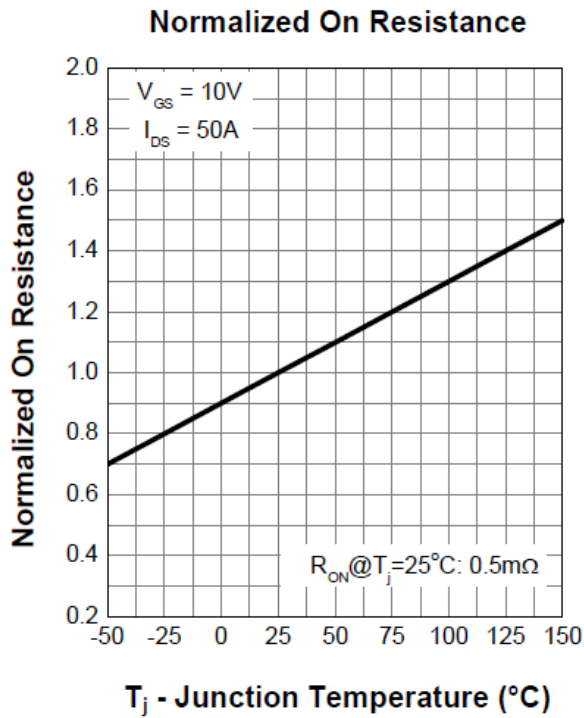


**Transfer Characteristics**



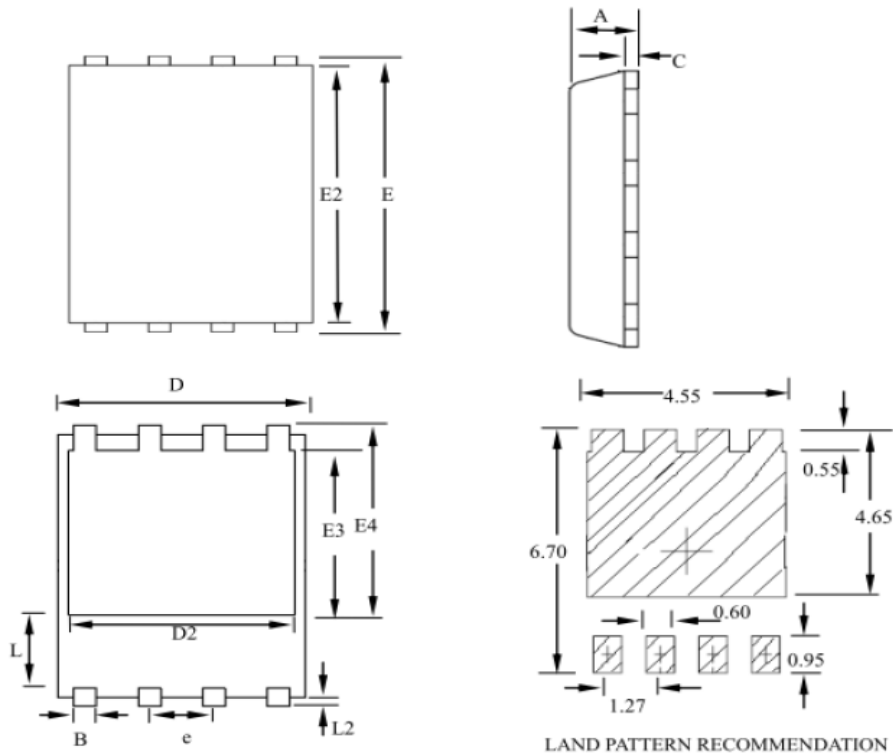
**Normalized Threshold Voltage**





## Ordering Information

Part Number	Package code	Packaging
HSBA005N03	PRPAK5*6	5000/Tape&Reel



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	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	--	5.90	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	--