

General Description

The HSBA0048 is the high cell density SGT N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the Synchronous Rectification for AC/DC Quick Charger.

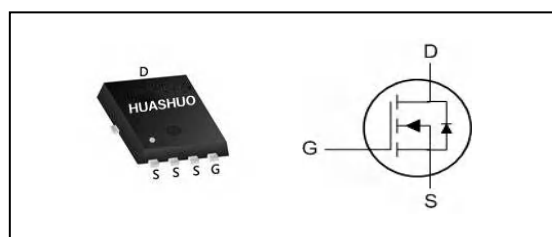
Product Summary

V_{DS}	100	V
$R_{DS(ON),TYP}$	6.6	m Ω
I_D	78	A

Features

- 100% EAS Guaranteed
- Low $R_{DS(ON)}$
- Low Gate Charge
- RoHs and Halogen-Free Compliant

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ^{1,6}	78	A
$I_D@T_C=70^\circ\text{C}$	Continuous Drain Current ^{1,6}	62	A
I_{DM}	Pulsed Drain Current ²	280	A
EAS	Single Pulse Avalanche Energy ³	61	mJ
I_{AS}	Avalanche Current	23	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	108	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10\text{s}$)	---	25	$^\circ\text{C/W}$
	Thermal Resistance Junction-Ambient ¹	---	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.15	$^\circ\text{C/W}$

N-Ch 100V Fast Switching MOSFETs
Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=13.5A$	---	6.6	8	$m\Omega$
	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V, I_D=11.5A$	---	8.7	10.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.7	2.3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
gfs	Forward Transconductance	$V_{DS}=5V, I_D=20A$	---	85	---	S
Qg	Total Gate Charge (10V)	$V_{DS}=50V, V_{GS}=10V, I_D=13.5A$	---	45	---	nC
Qg	Total Gate Charge (4.5V)		---	19.3	---	
Qgs	Gate-Source Charge		---	9.5	---	
Qgd	Gate-Drain Charge		---	4.8	---	
Td(on)	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3\Omega, I_D=13.5A$	---	10	---	ns
Tr	Rise Time		---	6.5	---	
Td(off)	Turn-Off Delay Time		---	45	---	
Tf	Fall Time		---	7.5	---	
Ciss	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	3320	---	pF
Coss	Output Capacitance		---	605	---	
Crss	Reverse Transfer Capacitance		---	20	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5,6}	$V_G=V_D=0V$, Force Current	---	---	48	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=13.5A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	33	---	nS
Q_{rr}	Reverse Recovery Charge		---	150	---	nC

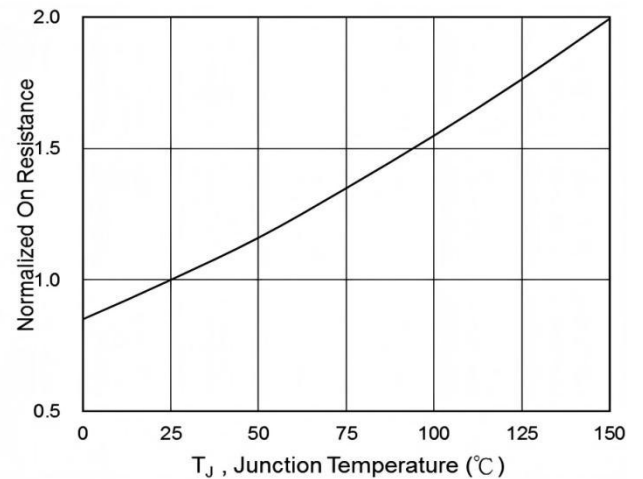
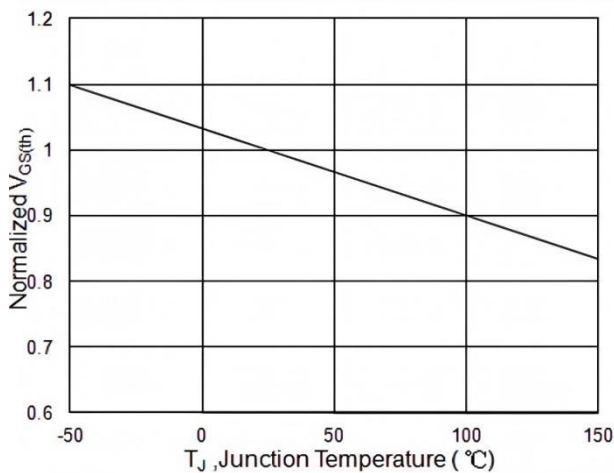
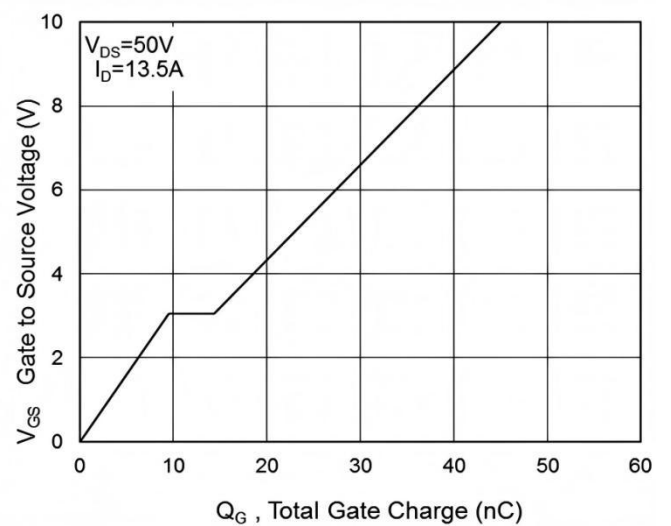
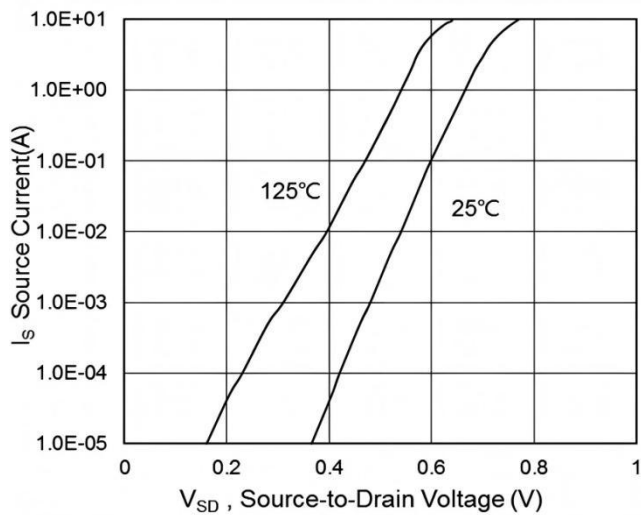
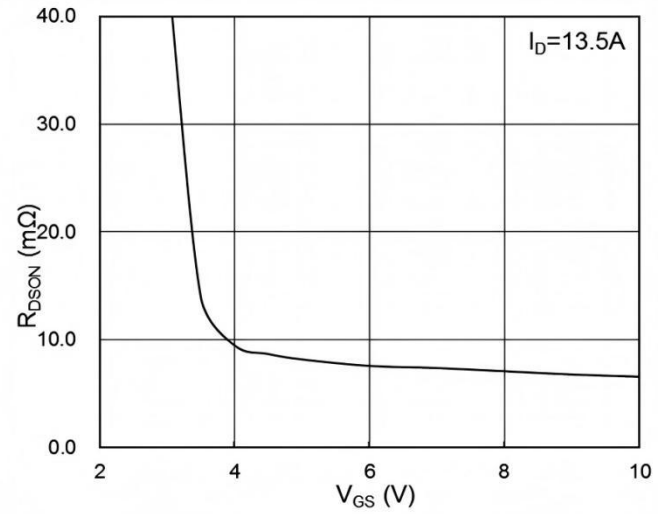
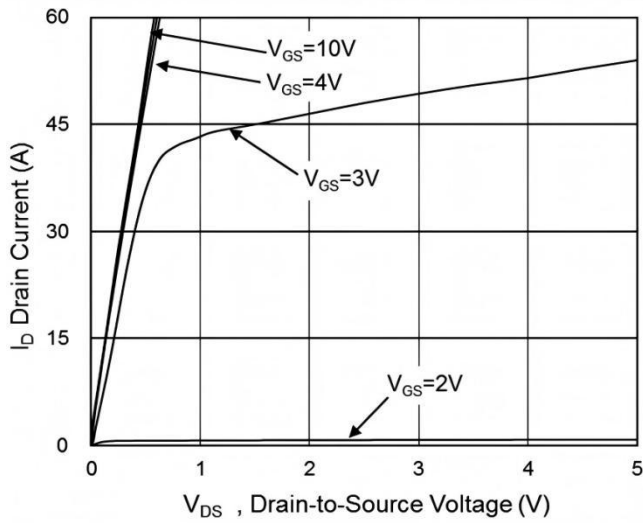
Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.3mH, I_{AS}=23A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.The maximum current rating is package limited.



N-Ch 100V Fast Switching MOSFETs

Typical Characteristics





N-Ch 100V Fast Switching MOSFETs

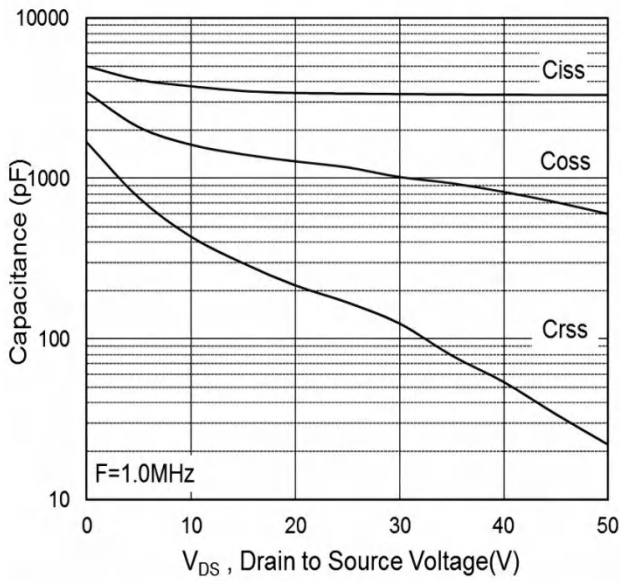


Fig.7 Capacitance

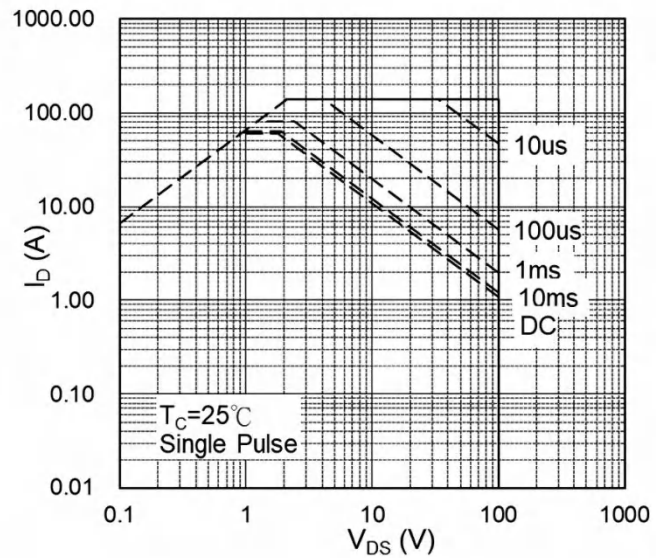


Fig.8 Safe Operating Area

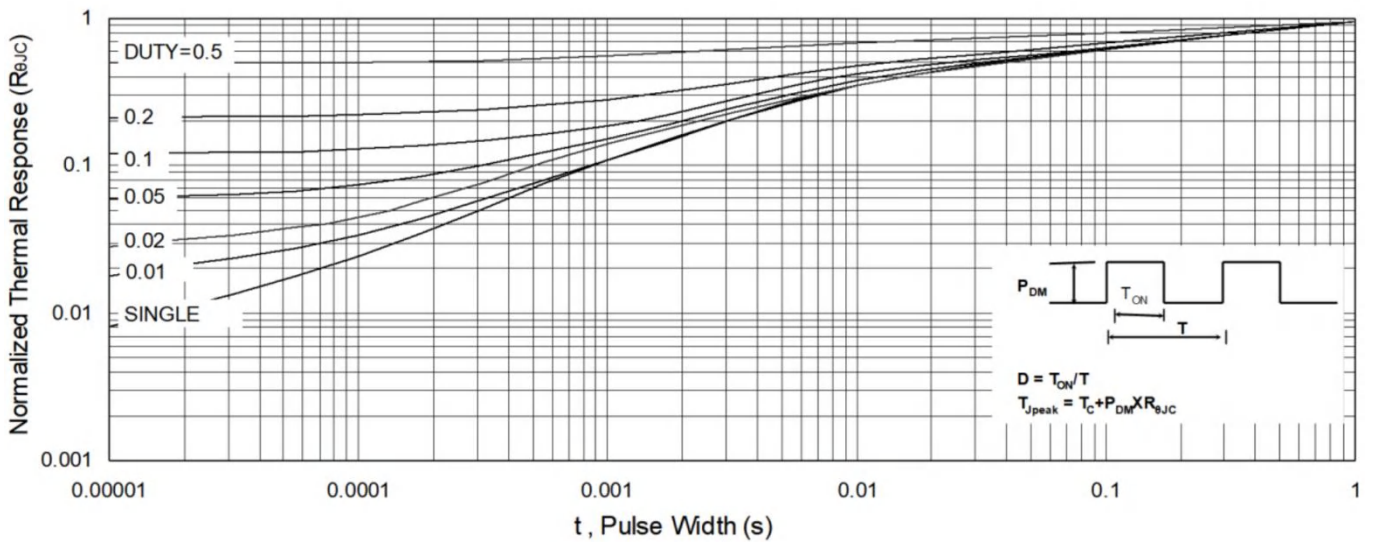


Fig.9 Normalized Maximum Transient Thermal Impedance

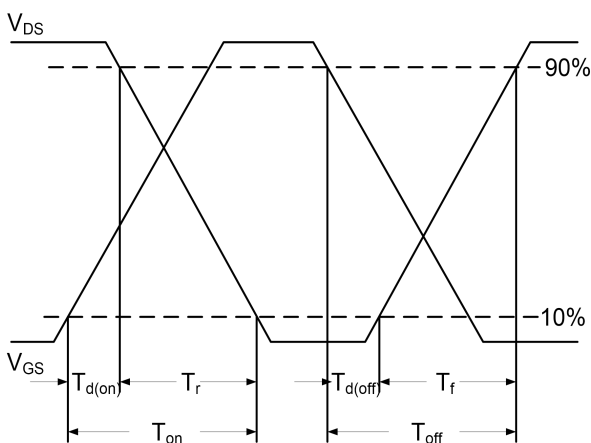


Fig.10 Switching Time Waveform

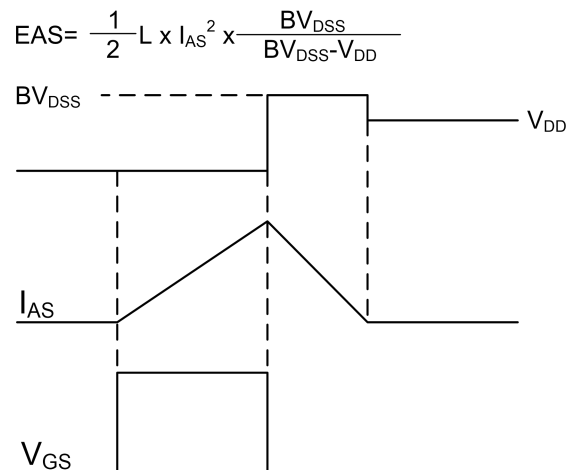
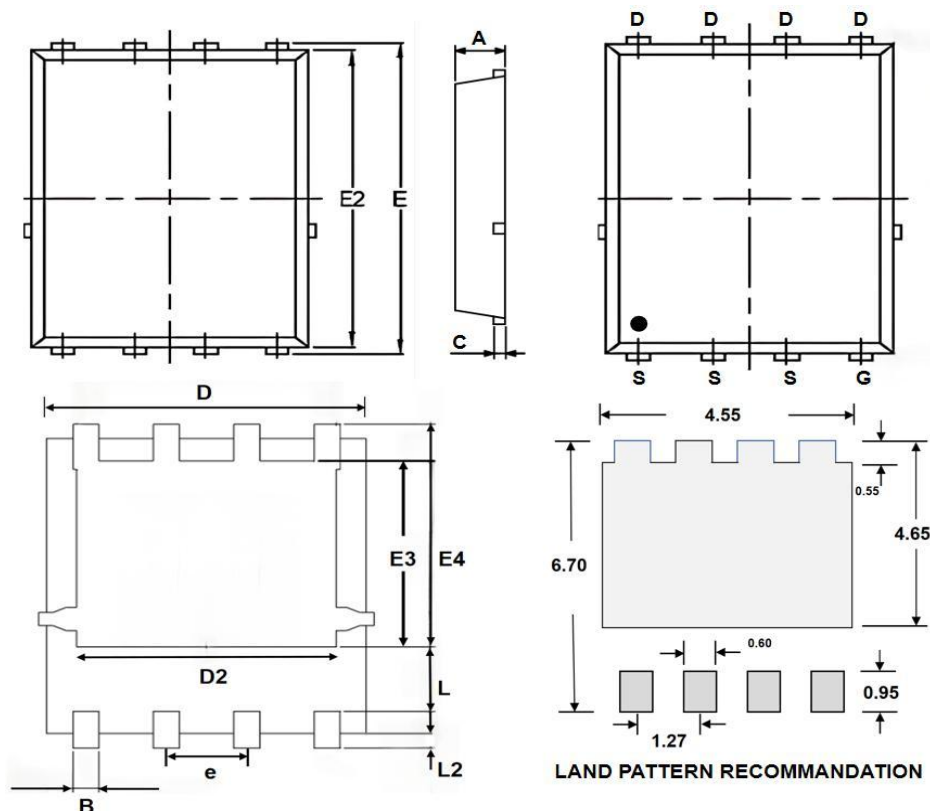


Fig.11 Unclamped Inductive Switching Waveform

Ordering Information

Part Number	Package code	Packaging
HSBA0048	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	--

HSBA0048 Marking :

