

General Description

The HSBE2730 is the low $R_{DS(on)}$ trench N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.

The HSBE2730 meet the RoHS and Green Product requirement with full function reliability approved.

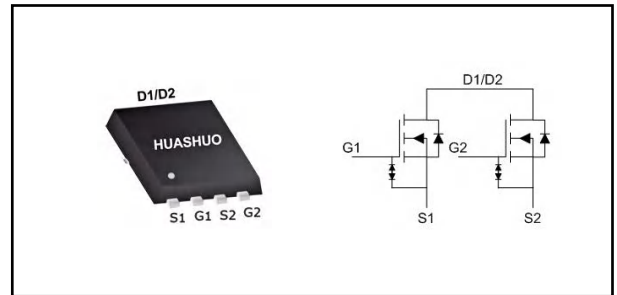
Product Summary

V_{DS}	20	V
$R_{DS(ON),max}$	17	m Ω
I_D	7	A

Features

- Low drain-source ON resistance
- Green Device Available
- ESD Protected Embedded

PRPAK3X3 NEP Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ¹	7	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ¹	5.8	A
I_{DM}	Pulsed Drain Current ²	43	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.47	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	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	85	$^\circ\text{C/W}$



Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.014	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =3A	12	14.5	17	mΩ
		V _{GS} =4.0V, I _D =3A	12.5	15	18.5	mΩ
		V _{GS} =3.1V, I _D =3A	13	16.5	22	mΩ
		V _{GS} =2.5V, I _D =3A	14.5	18.5	24.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.7	1.2	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-2.09	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V, T _J =25°C	---	---	25	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	---	±10	uA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.83	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =16V, V _{GS} =4.5V, I _D =3A	---	9.86	---	nC
Q _{gs}	Gate-Source Charge		---	1.41	---	
Q _{gd}	Gate-Drain Charge		---	2.48	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =10V, V _{GS} =4.5V, R _G =3.3Ω, I _D =3A	---	7	---	ns
T _r	Rise Time		---	36	---	
T _{d(off)}	Turn-Off Delay Time		---	46.5	---	
T _f	Fall Time		---	15	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, F=1MHz	---	735	---	pF
C _{oss}	Output Capacitance		---	83	---	
C _{rss}	Reverse Transfer Capacitance		---	81	---	

Diode Characteristics

Symbol	Parameter	Conditions	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V, Force Current	7	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =7A, T _J =25°C	1.2	V

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 ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°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

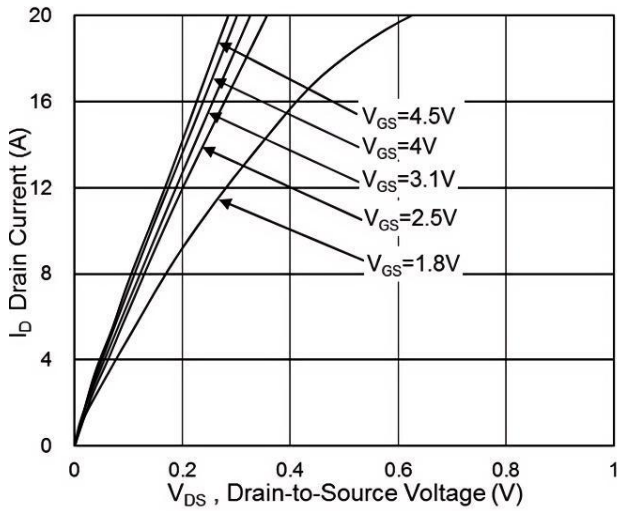


Fig.1 Typical Output Characteristics

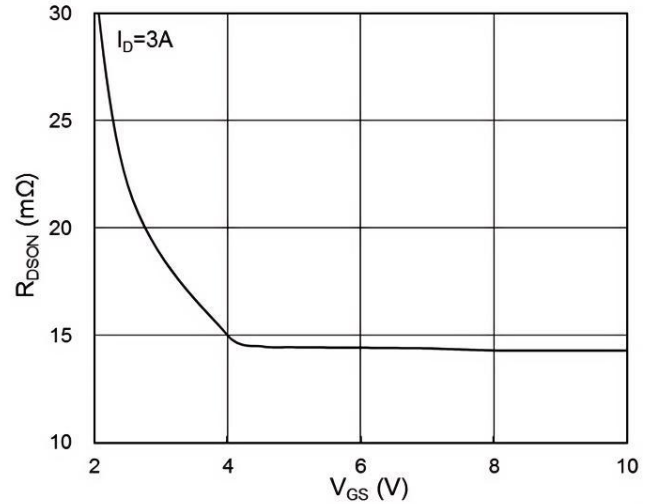


Fig.2 On-Resistance vs. Gate-Source Voltage

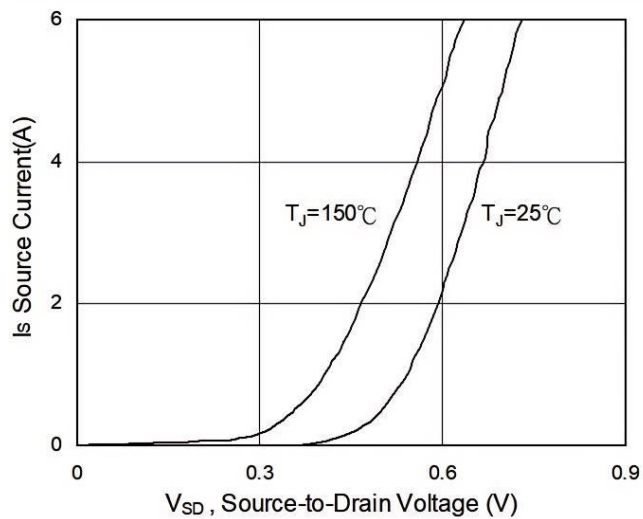


Fig.3 Forward Characteristics of Reverse

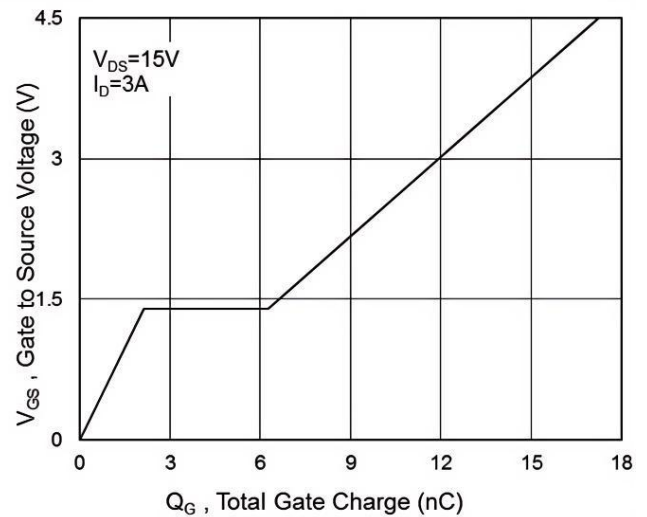


Fig.4 Gate-Charge Characteristics

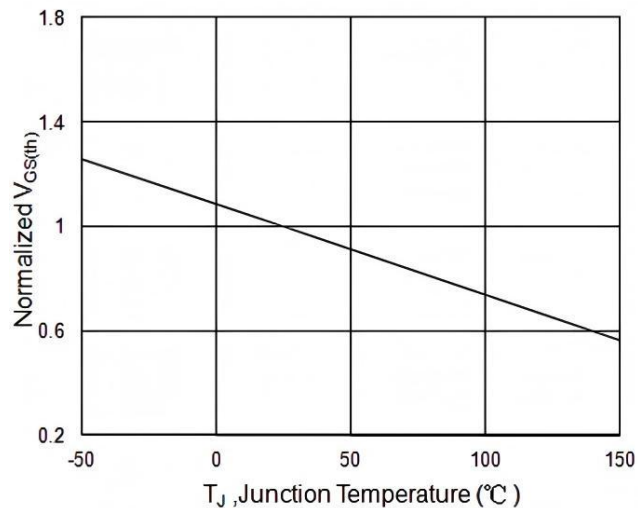


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

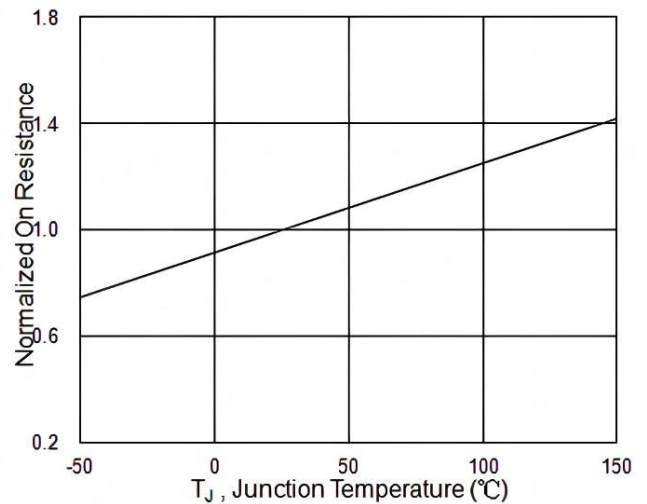


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

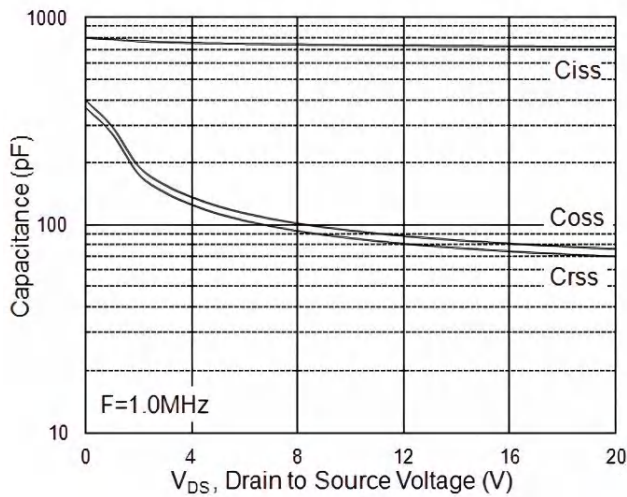


Fig.7 Capacitance

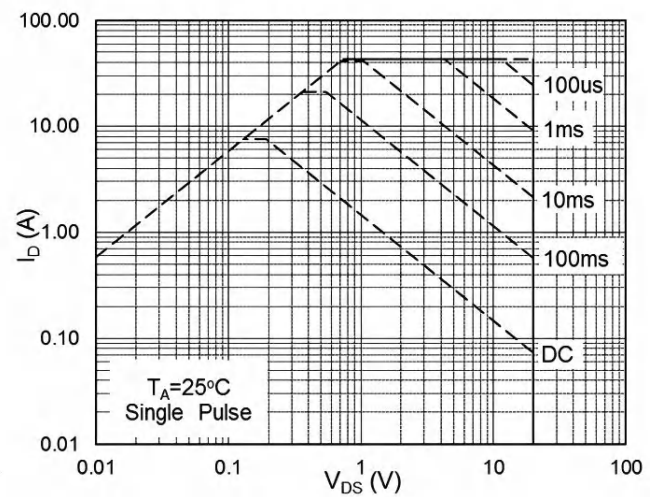


Fig.8 Safe Operating Area

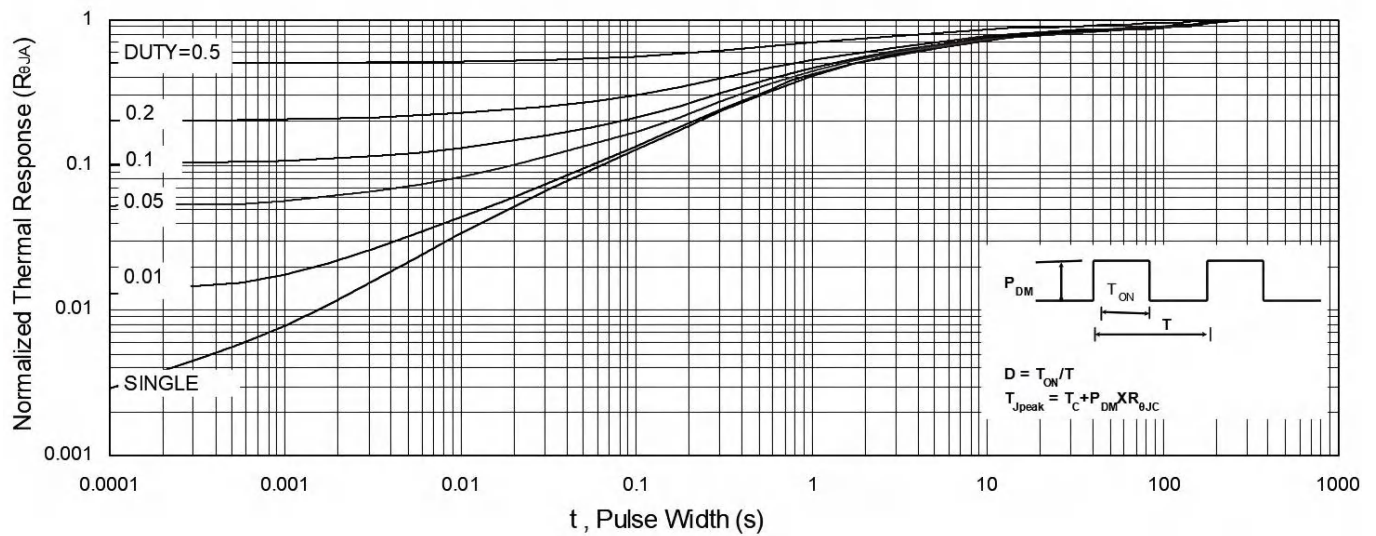


Fig.9 Normalized Maximum Transient Thermal Impedance

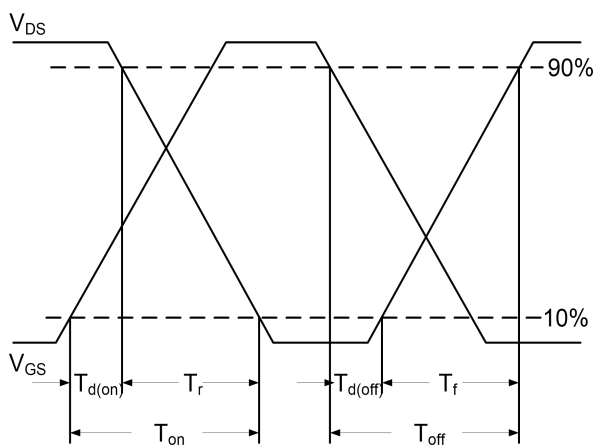


Fig.10 Switching Time Waveform

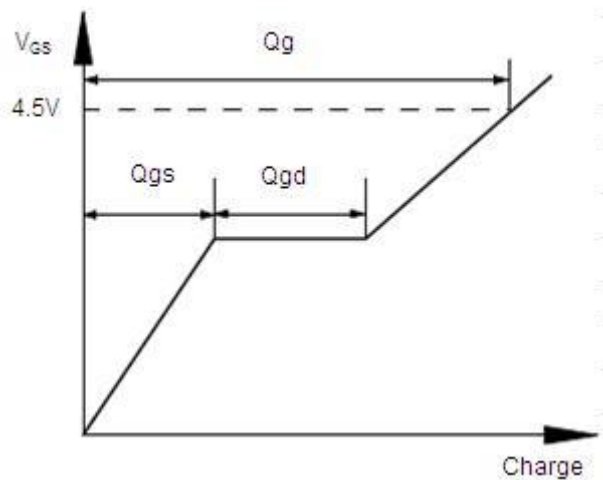


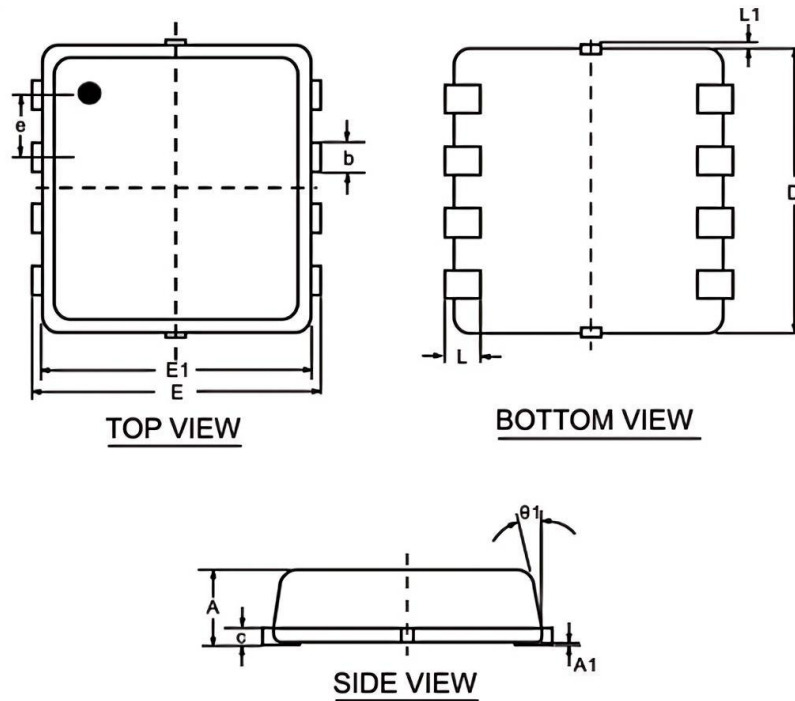
Fig.11 Gate Charge Waveform



Ordering Information

Part Number	Package code	Packaging
HSBE2730	PRPAK3*3 NEP	3000/Tape&Reel

PRPAK3*3 NEP Package Outline



SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.700	0.800	0.900
A1	0.000	—	0.050
b	0.240	0.300	0.350
C	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.650 BSC		
L	0.200	0.375	0.450
L1	0.000	—	0.100
$\theta1$	0°	10°	12°



HSBE2730 Marking:

