HSBB1R7N04

N-Ch 40V Fast Switching MOSFETs

Description

The HSBB1R7N04 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

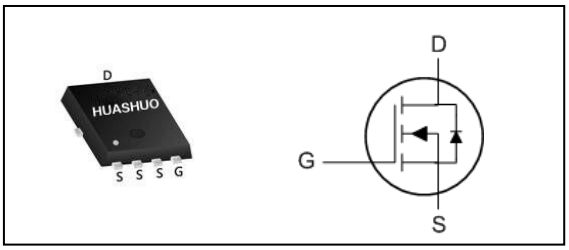
The HSBB1R7N04 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

Product Summary

V_{DS}	40	V
$R_{DS(ON),typ}$	1.2	mΩ
I_D	90	A

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

PRPAK3*3 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℃	Continuous Drain Current, V_{GS} @ 10V[1]	90	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	61	A
I_{DM}	Pulsed Drain Current[2]	240	A
EAS	Single Pulse Avalanche Energy[3]	338	mJ
I_S@T_C=25℃	Avalanche Current	90	A
P_D@T_C=25℃	Total Power Dissipation[4]	35	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	3.5	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	1.2	1.7	mΩ
		V_{GS}=4.5V , I_D=20A	---	2.3	2.8	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	---	3.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=32V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=20V , V_{GS}=10V , I_D=30A	---	51	---	nC
Q_{gs}	Gate-Source Charge		---	11	---	
Q_{gd}	Gate-Drain Charge		---	9	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=20V , V_{GS}=10V , R_G=3.9Ω, R_L=0.66Ω, I_D=30A	---	10	---	ns
T_r	Rise Time		---	68	---	
$T_{d(off)}$	Turn-Off Delay Time		---	49	---	
T_f	Fall Time		---	40	---	
C_{iss}	Input Capacitance	V_{DS}=20V , V_{GS}=0V , f=1MHz	---	2684	---	pF
C_{oss}	Output Capacitance		---	1025	---	
C_{rss}	Reverse Transfer Capacitance		---	75	---	

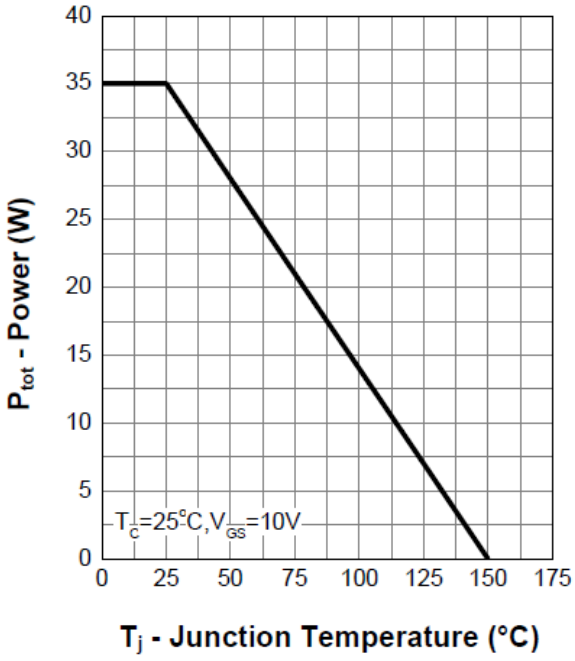
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	90	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=A , T_J=25℃	---	---	1.3	V
t_{rr}	Reverse Recovery Time	I_F=30A , dI/dt=100A/μs , T_J=25℃	---	47	---	nS
Q_{rr}	Reverse Recovery Charge		---	35	---	nC

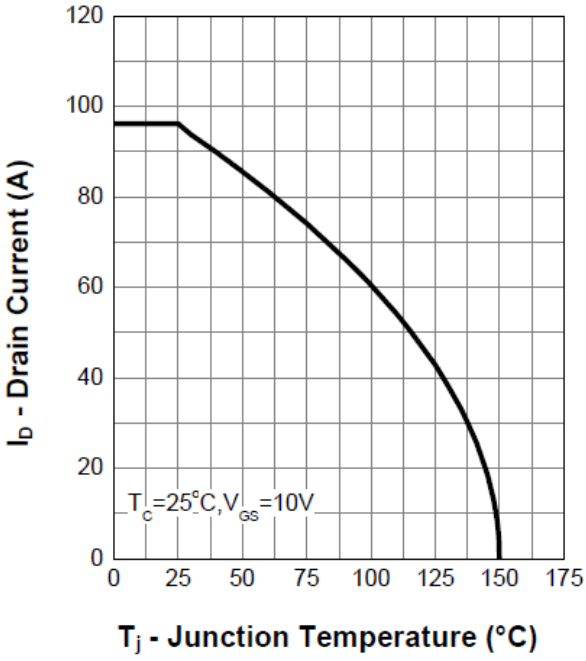
Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

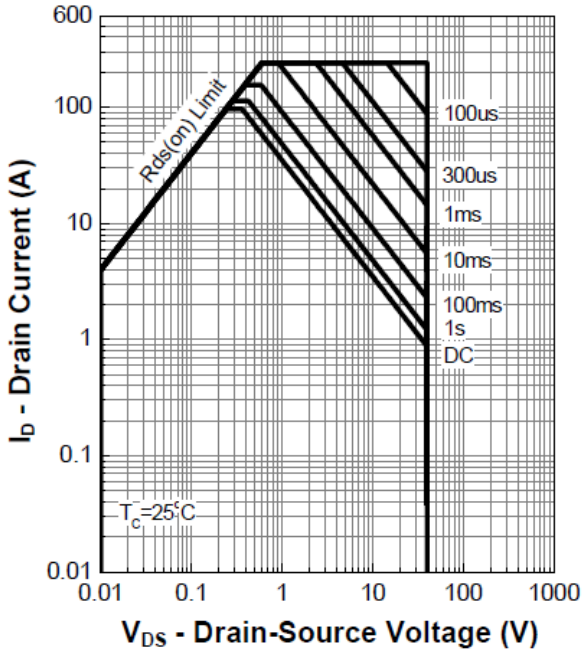
Power Capability



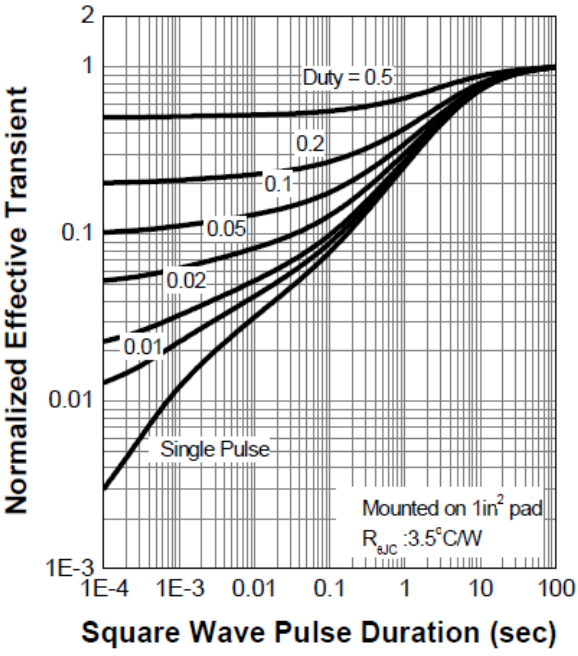
Current Capability



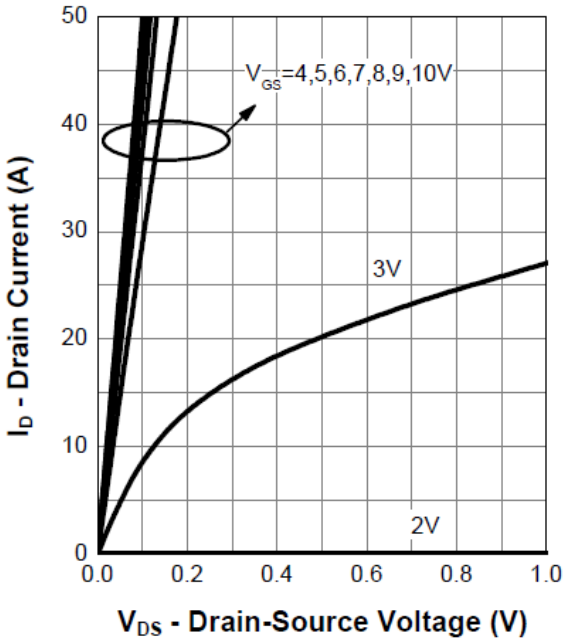
Safe Operation Area



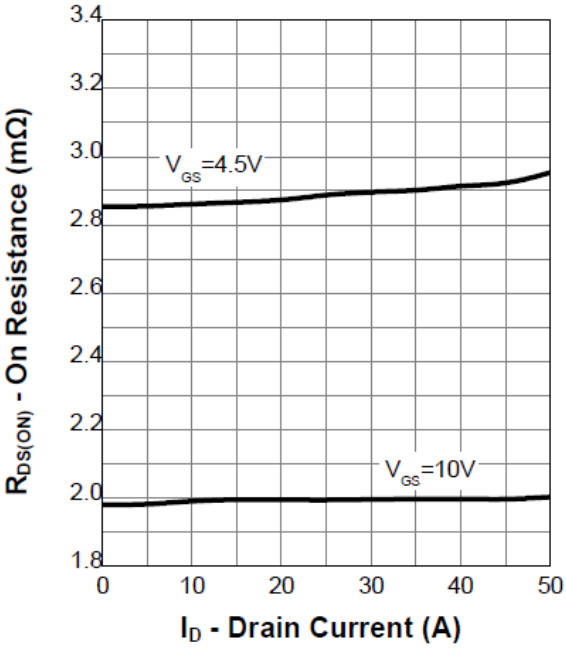
Transient Thermal Impedance



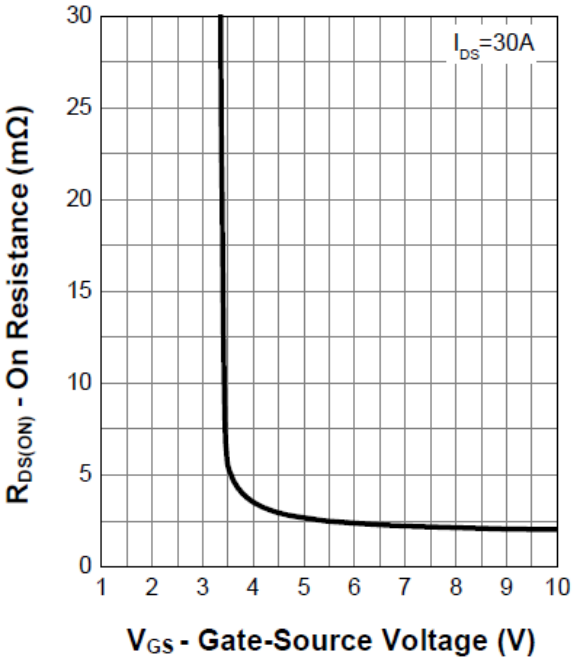
Output Characteristics



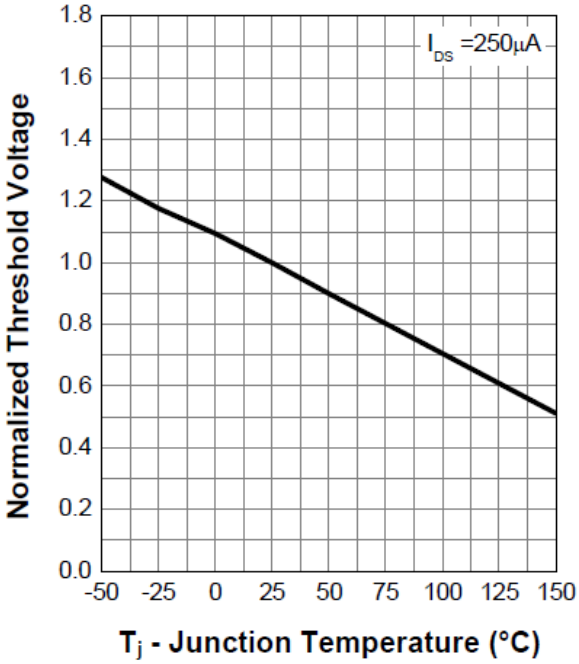
On Resistance

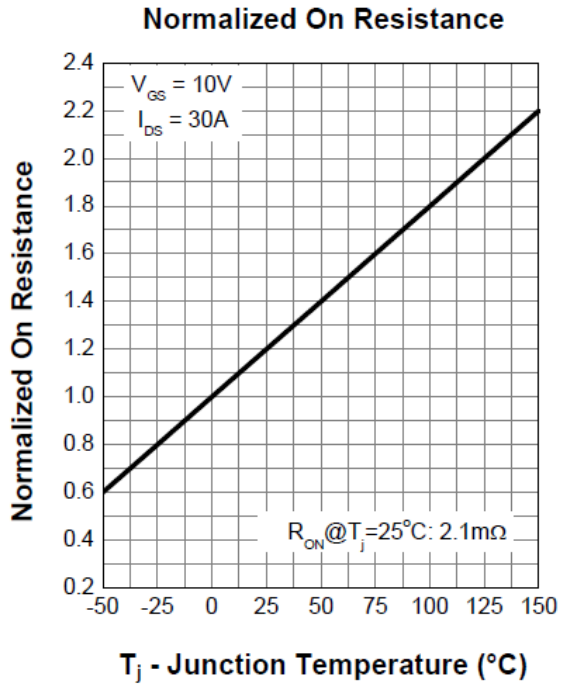


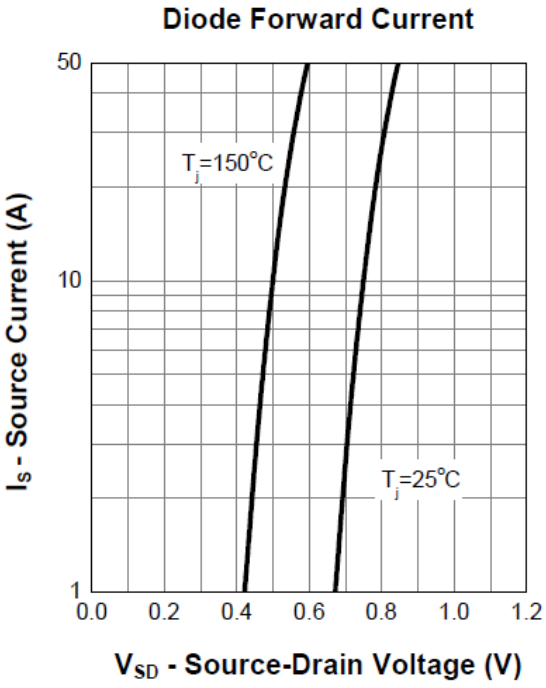
Transfer Characteristics

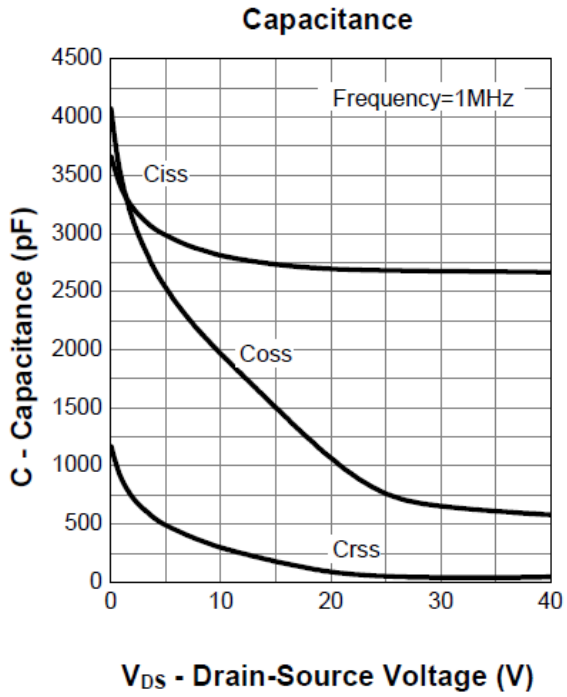


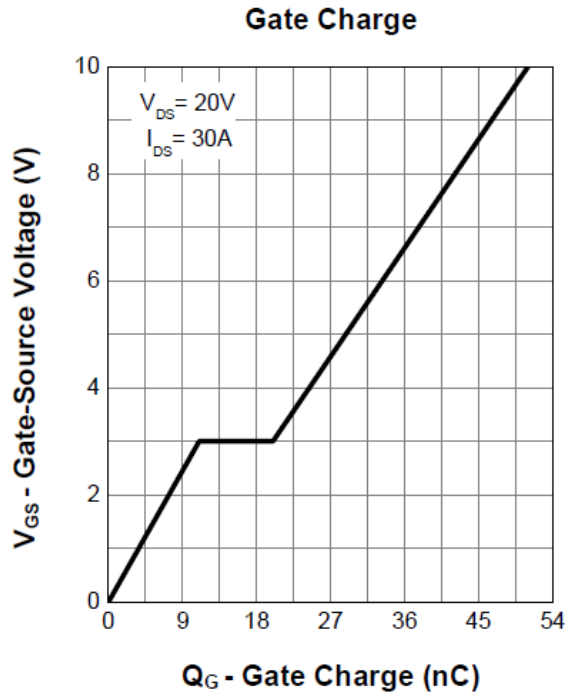
Normalized Threshold Voltage




Normalized On Resistance
V_{GS} = 10V
I_{DS} = 30A
R_{ON}@T_j=25°C: 2.1mΩ
Normalized On Resistance
T_j - Junction Temperature (°C)


Diode Forward Current
T_j=150°C
T_j=25°C
I_S - Source Current (A)
V_{SD} - Source-Drain Voltage (V)


Capacitance
Frequency=1MHz
Ciss
Coss
Crss
C - Capacitance (pF)
V_{DS} - Drain-Source Voltage (V)


Gate Charge
V_{DS}= 20V
I_{DS}= 30A
V_{GS} - Gate-Source Voltage (V)
Q_G - Gate Charge (nC)

PDFN 3x3-8L Package