

## General Description

The HSK10N10 is the high cell density trenched N-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The HSK10N10 meet the RoHS and Green Product requirement with full function reliability approved.

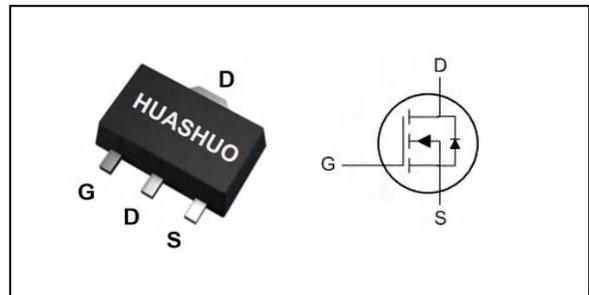
## Features

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench Technology

## Product Summary

V <sub>DS</sub>	100	V
R <sub>DS(ON),typ</sub>	75	mΩ
I <sub>D</sub>	10	A

## SOT-89 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>A</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	10	A
I <sub>D</sub> @T <sub>A</sub> =70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	8	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	30	A
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>3</sup>	1.7	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient(steady state) <sup>1</sup>	---	100	°C/W
	Thermal Resistance Junction-ambient(t<10s) <sup>1</sup>	---	75	°C/W



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.122	---	V/°C
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	---	75	85	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	---	80	95	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	1.8	2.5	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-4.84	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	10	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =2A	---	15	---	S
Q <sub>g</sub>	Total Gate Charge (10V)	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =1A	---	12	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	2.9	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	1.9	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω I <sub>D</sub> =1A	---	3.6	---	ns
T <sub>r</sub>	Rise Time		---	24	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	20	---	
T <sub>f</sub>	Fall Time		---	8.4	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	---	1190	---	pF
C <sub>oss</sub>	Output Capacitance		---	51	---	
C <sub>riss</sub>	Reverse Transfer Capacitance		---	40	---	

**Diode Characteristics**

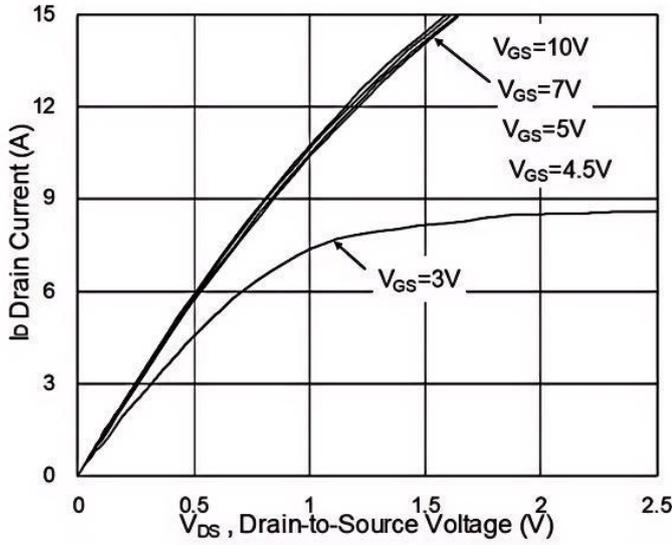
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,4</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	5	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V

Note :

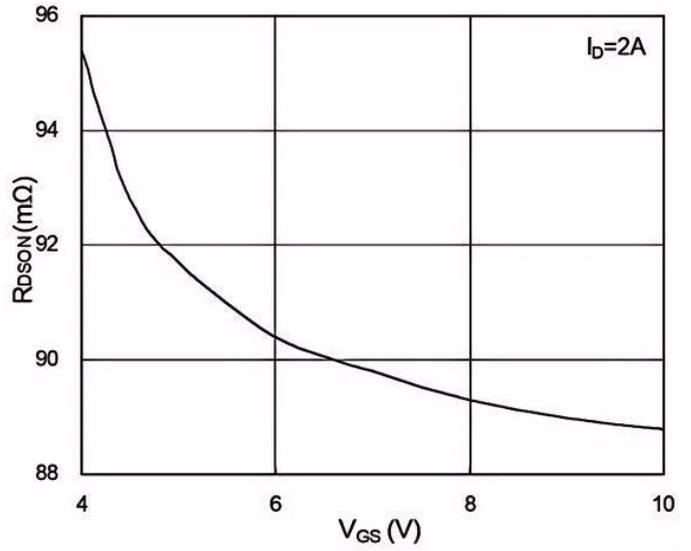
- 1.The data tested by surface mounted on a 1 inch<sup>2</sup>FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.



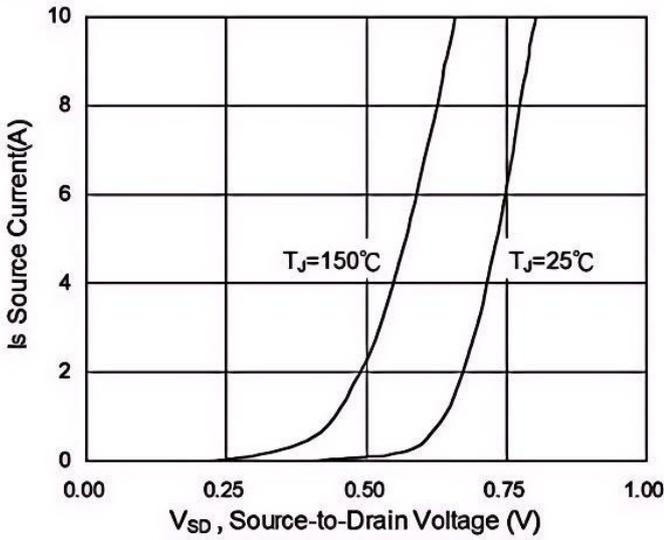
**Typical Characteristics**



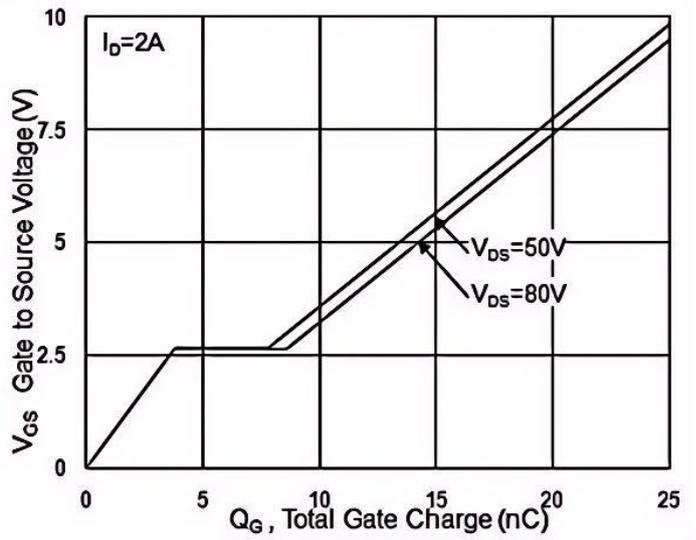
**Fig.1 Typical Output Characteristics**



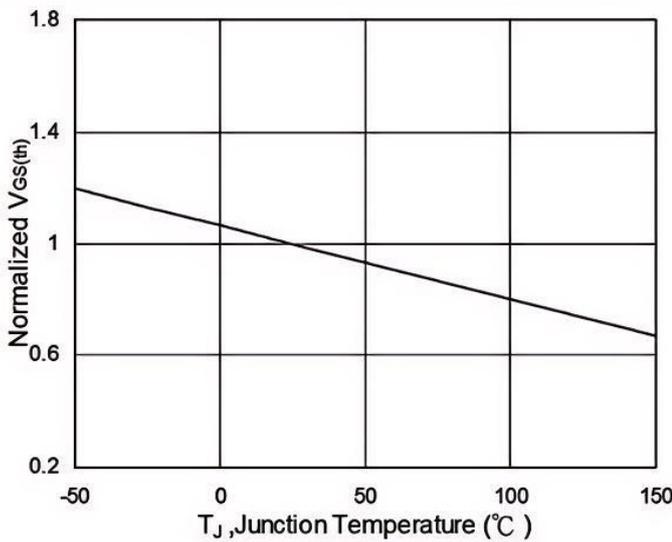
**Fig.2 On-Resistance vs G-S Voltage**



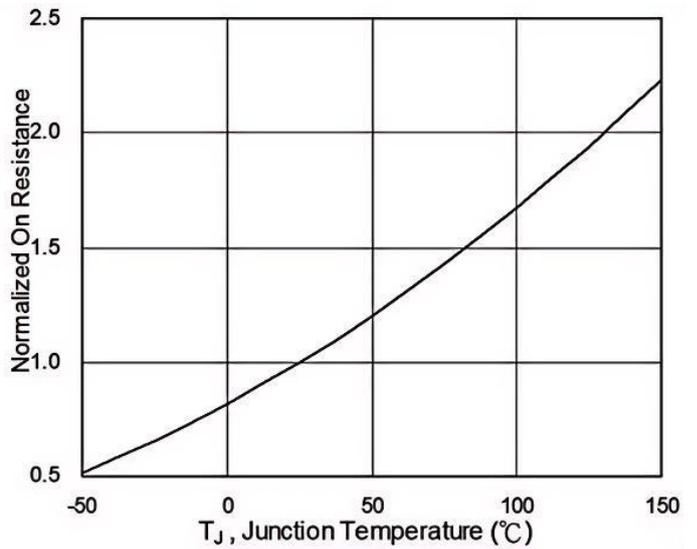
**Fig.3 Source Drain Forward Characteristics**



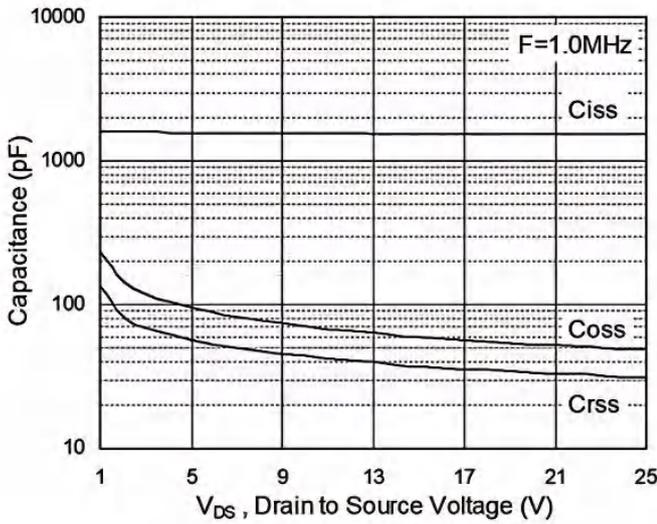
**Fig.4 Gate-Charge Characteristics**



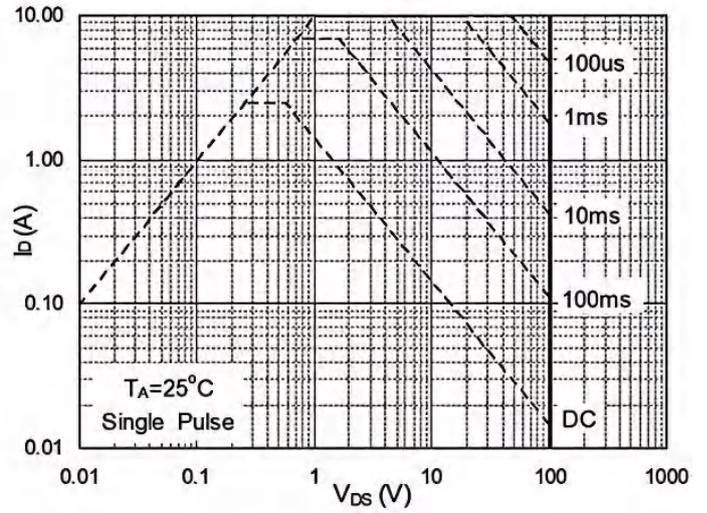
**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**



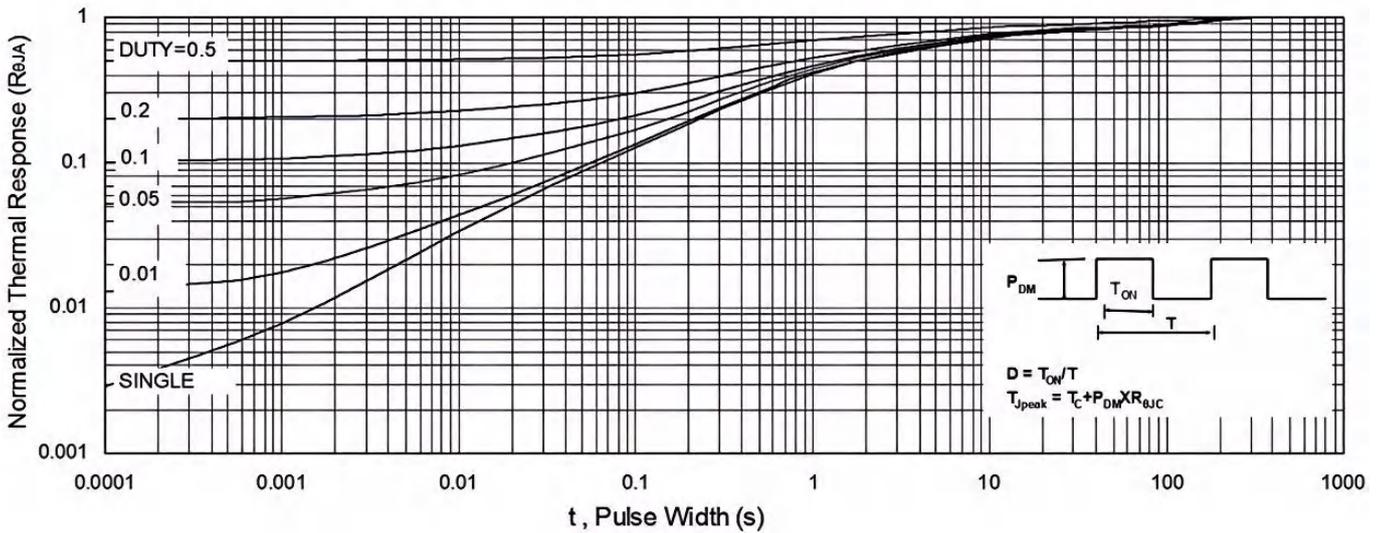
**Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$**



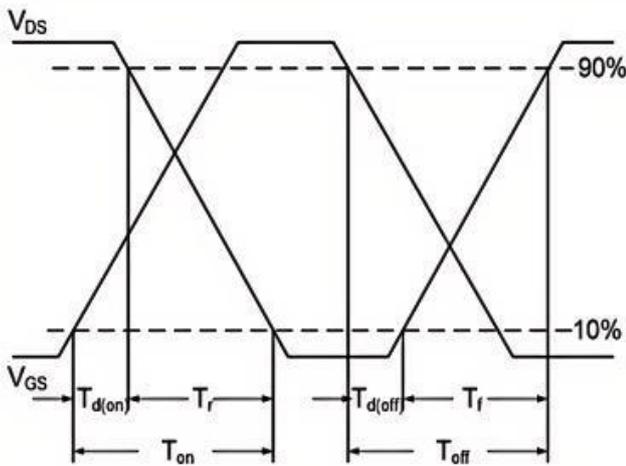
**Fig.7 Capacitance**



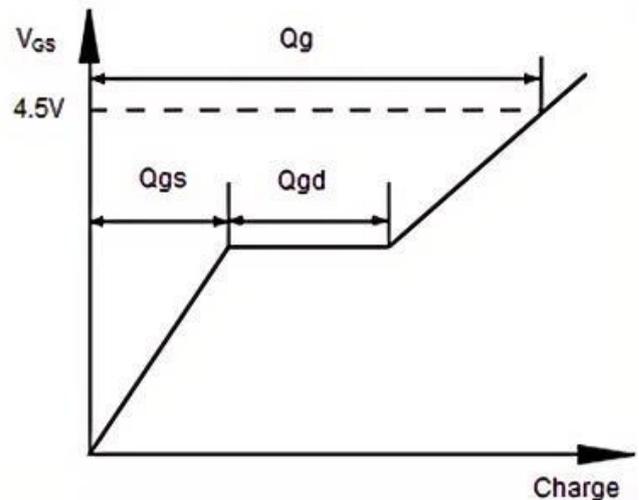
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



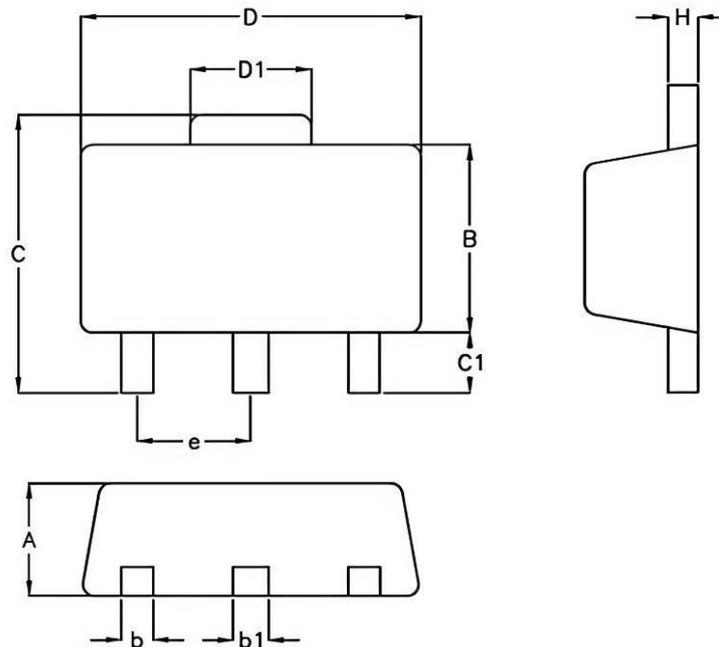
**Fig.11 Gate Charge Waveform**



## Ordering Information

Part Number	Package code	Packaging
HSK10N10	SOT-89	1000/Tape&Reel

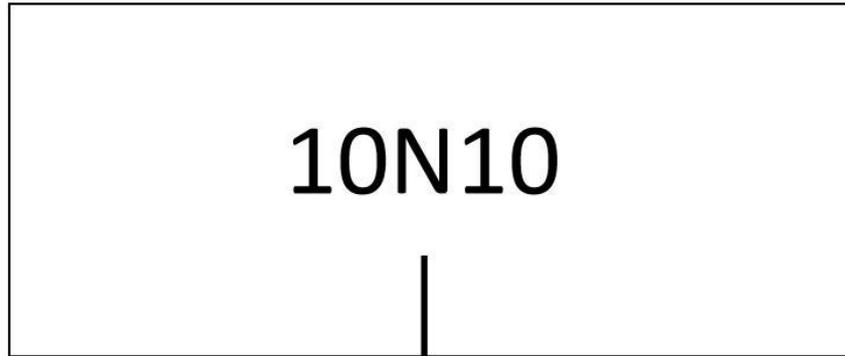
### SOT-89 Package Outline



SYMBOLS	MILLIMETERS		NCHES	
	MIN	MAX	MIN	MAX
A	1.397	1.600	0.055	0.063
b	0.420	0.540	0.017	0.021
b1	0.420	0.540	0.017	0.021
B	2.388	2.591	0.094	0.102
C	3.937	4.242	0.155	0.167
C1	0.787	1.194	0.031	0.047
D	4.394	4.597	0.173	0.181
D1	1.397	1.753	0.055	0.069
e	1.448	1.549	0.057	0.061
H	0.350	0.44	0.014	0.017



## HSK10N10 TOP Marking



10N10

Part Number