# HSS3416E

N-Ch 20V Fast Switching MOSFETs

Description

The HSS3416E is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The HSS3416E meet the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology
- ESD Protected 2KV

Product Summary

V_{DS}	20	V
$R_{DS(ON),TYP}$	20	mΩ
I_D	6	A

SOT23 Pin Configuration
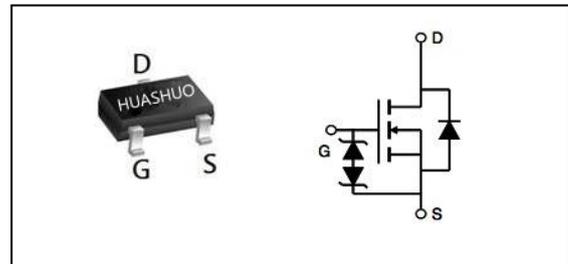
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 4.5V1	6.0	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 4.5V1	5.0	A
I_{DM}	Pulsed Drain Current2	22	A
P_D@T_A=25°C	Total Power Dissipation3	1	W
P_D@T_A=70°C	Total Power Dissipation3	0.66	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient 1	120	°C/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	20	---	---	V
△BV$_{DSS}$/△T$_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I$_D$=1mA	---	0.018	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance2	V$_{GS}$=4.5V , I$_D$=4A	---	20	25	mΩ
		V$_{GS}$=2.5V , I$_D$=3A	---	26	33	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	0.6	0.8	1.0	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	-3.1	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=16V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=16V , V$_{GS}$=0V , T$_J$=55℃	---	---	5	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±12V , V$_{DS}$=0V	---	---	±100	nA
gfs	Forward Transconductance	V$_{DS}$=5V , I$_D$=4A	---	30	---	S
Q$_g$	Total Gate Charge (4.5V)	V$_{DS}$=15V , V$_{GS}$=4.5V , I$_D$=4A	---	8.6	---	nC
Q$_{gs}$	Gate-Source Charge		---	1.37	---	
Q$_{gd}$	Gate-Drain Charge		---	2.3	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DS}$=10V , V$_{GS}$=4.5V , R$_G$=3.3Ω I$_D$=4A	---	5.2	---	ns
T$_r$	Rise Time		---	34	---	
T$_{d(off)}$	Turn-Off Delay Time		---	23	---	
T$_f$	Fall Time		---	9.2	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	670	---	pF
C$_{oss}$	Output Capacitance		---	75	---	
C$_{rss}$	Reverse Transfer Capacitance		---	68	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current1,4	V$_G$=V$_D$=0V , Force Current	---	---	6	A
I$_{SM}$	Pulsed Source Current2,4		---	---	17	A
V$_{SD}$	Diode Forward Voltage2	V$_{GS}$=0V , I$_S$=1A , T$_J$=25℃	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch2 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
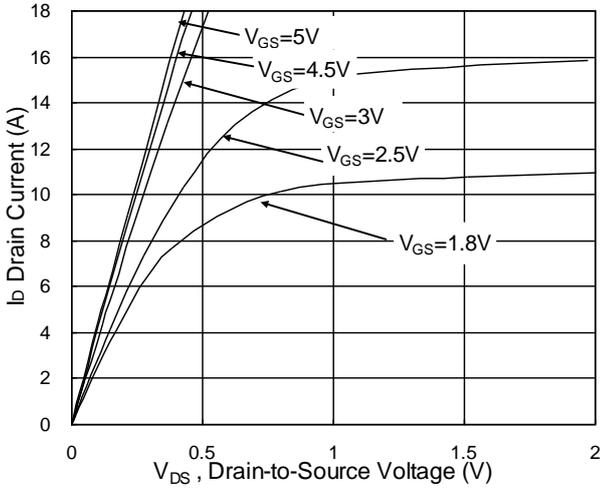
**Fig.1 Typical Output Characteristics**
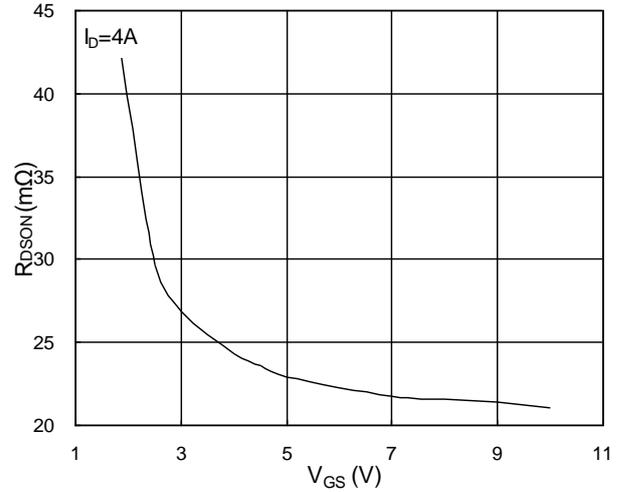

Fig.2 On-Resistance vs. Gate-Source
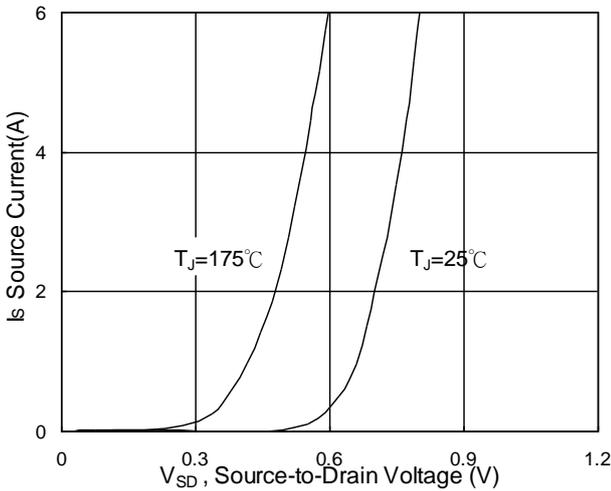
Fig.3 Forward Characteristics Of Reverse
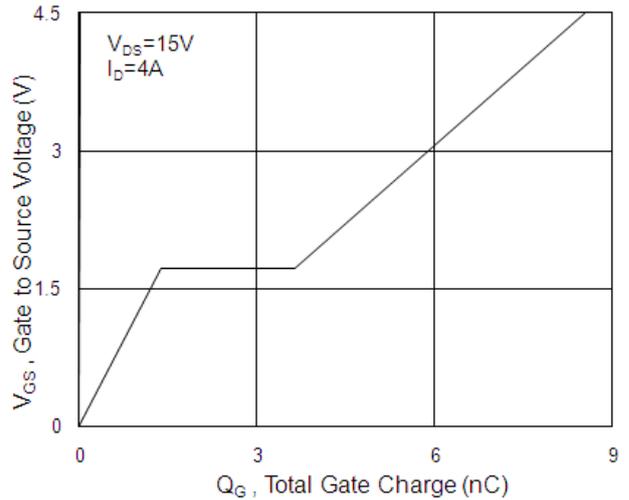
Fig.4 Gate-Charge Characteristics
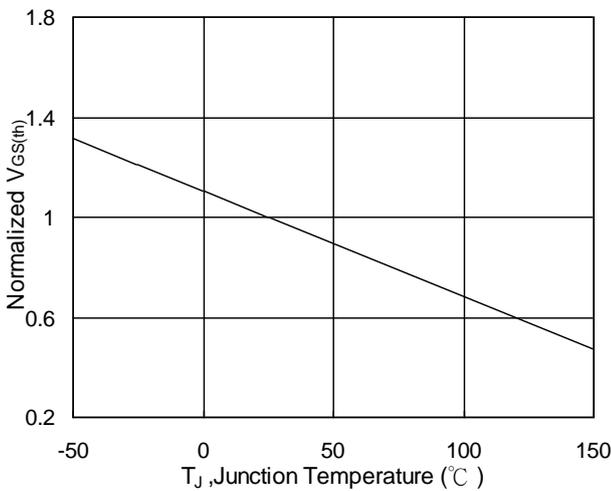
Fig.5 Normalized $V_{GS(th)}$ vs. T_J
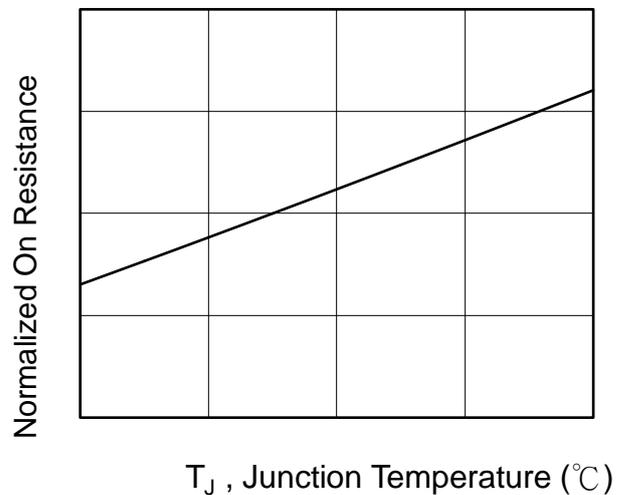

Fig.6 Normalized R_{DSON} vs. T_J
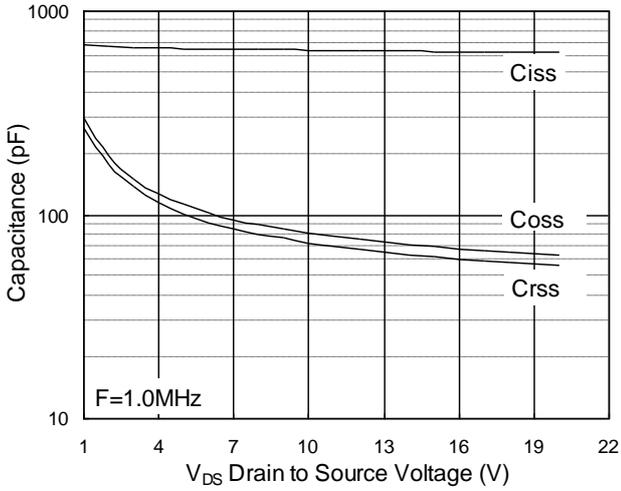
Fig.7 Capacitance
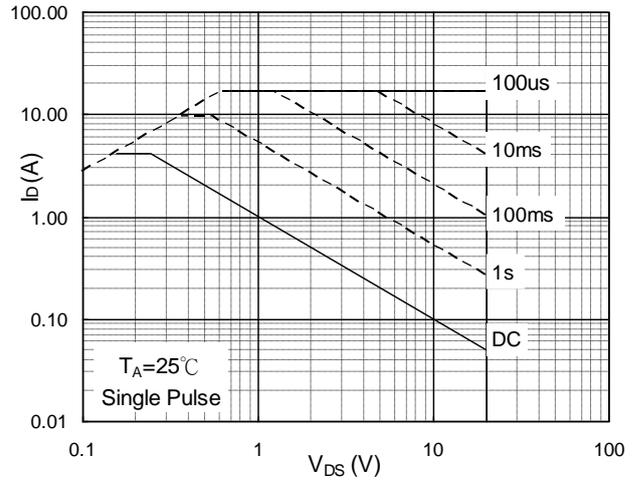
**Fig.8 Safe Operating Area**
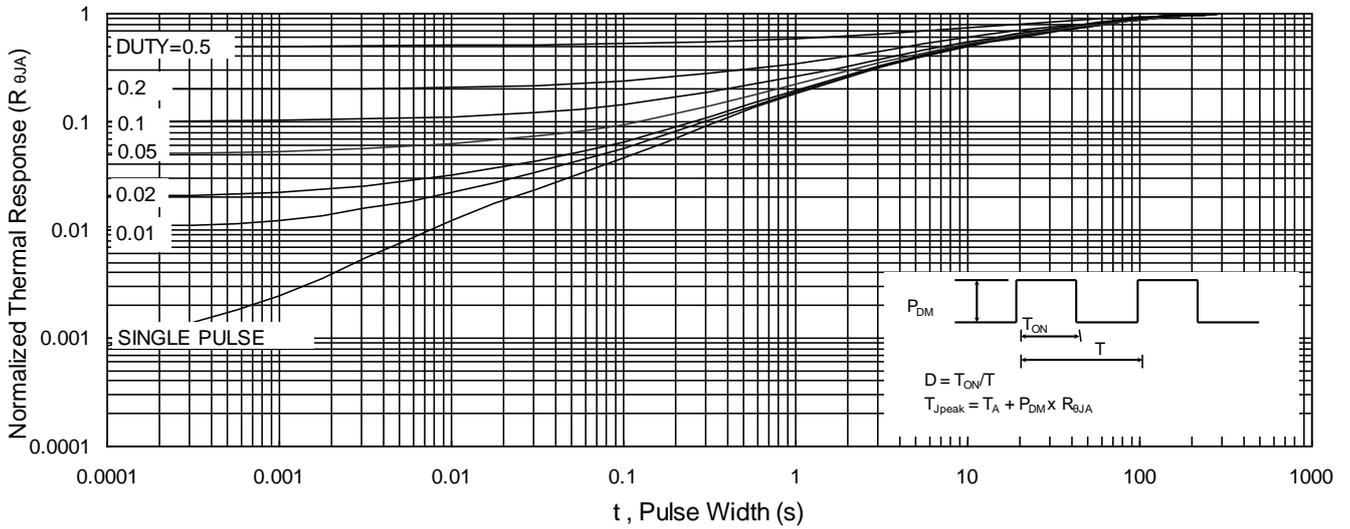
Fig.9 Normalized Maximum Transient Thermal Impedance
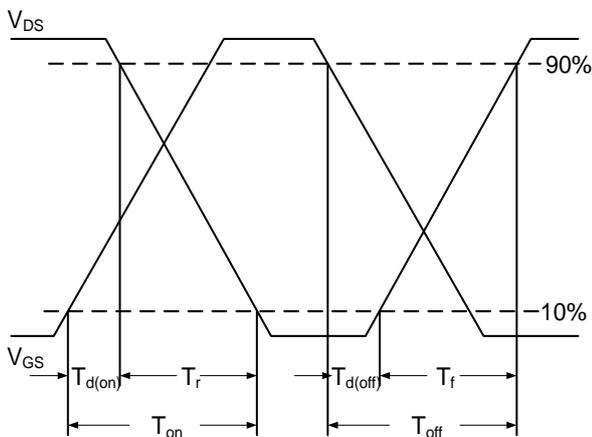
Fig.10 Switching Time Waveform
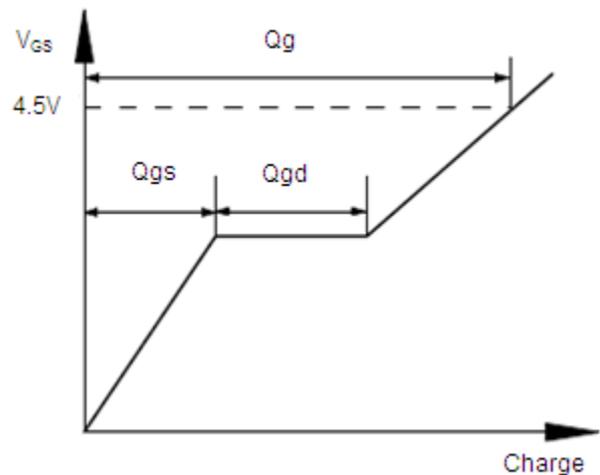
Fig.11 Gate Charge Waveform

Ordering Information

Part Number	Package code	Packaging
HSS3416E	SOT-23L	3000/Tape&Reel
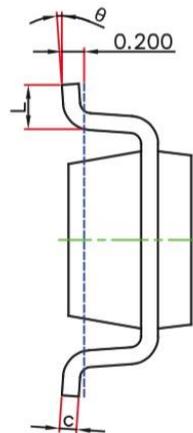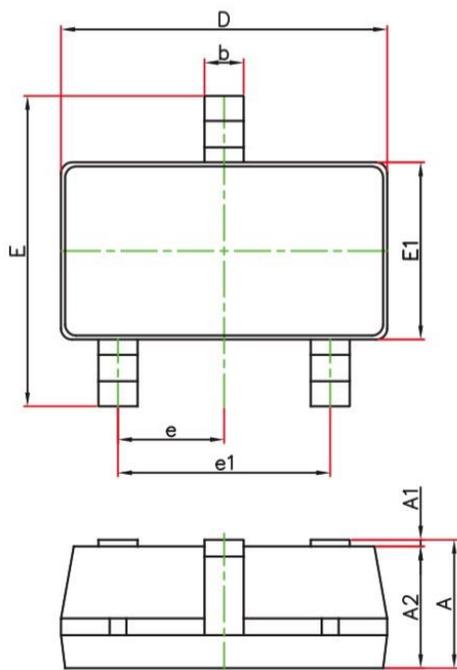
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET *category:*

Click to view products by HUASHUO *manufacturer:*

Other Similar products are found below :

614233C 648584F MCH3443-TL-E MCH6422-TL-E FDPF9N50NZ FW216A-TL-2W FW231A-TL-E APT5010JVR NTNS3A92PZT5G IRF100S201 JANTX2N5237 2SK2464-TL-E 2SK3818-DL-E FCA20N60_F109 FDZ595PZ STD6600NT4G FSS804-TL-E 2SJ277-DL-E 2SK1691-DL-E 2SK2545(Q,T) D2294UK 405094E 423220D MCH6646-TL-E TPCC8103,L1Q(CM 367-8430-0972-503 VN1206L 424134F 026935X 051075F SBVS138LT1G 614234A 715780A NTNS3166NZT5G 751625C 873612G IRF7380TRHR IPS70R2K0CEAKMA1 RJK60S3DPP-E0#T2 RJK60S5DPK-M0#T0 APT5010JVFR APT12031JFLL APT12040JVR DMN3404LQ-7 NTE6400 JANTX2N6796U JANTX2N6784U JANTXV2N5416U4 SQM110N05-06L-GE3 SIHF35N60E-GE3