



N-Channel Enhancement Mode MOSFET with ESD Protection

● Features

VDS	VGS	RDSon TYP	ID	ESD
20V	±12V	18mR@10V 20mR@4V5 24mR@2V5 30mR@1V8	5A	2kV

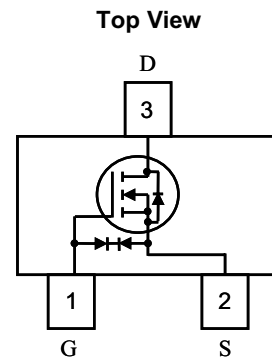
● General Description

This device uses advanced trench technology to provide excellent RDS(ON) , low gate charge and operation with gate voltages as low as 1.8V and it is protected from ESD. These features make it suitable for use as a load switch or in PWM applications.

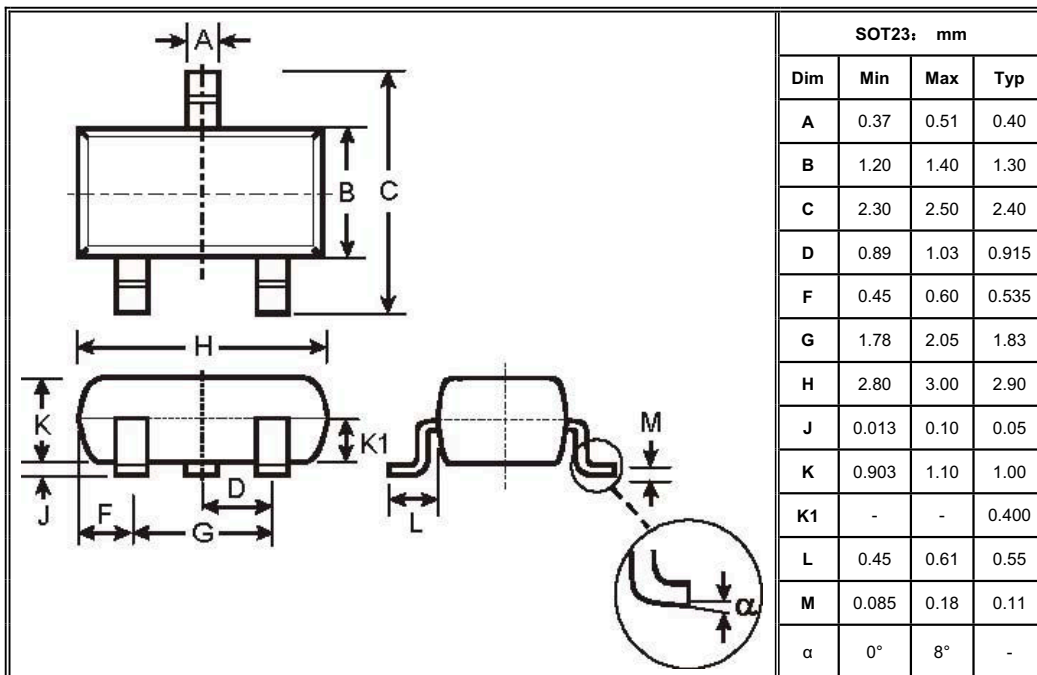
● Applications

- Load Switch
- Portable Devices
- DCDC Conversion

● Pin Configuration



● Package Information





HX3416

● **Absolute Maximum Ratings** @ $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Drain Current ^(Note)	Continuous	I_D	5	A
	Pulsed		25	
Power Dissipation ^(Note)		P_D	500 ⁽¹⁾ 850 ⁽²⁾	mW
Operating and Storage Junction Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Note:

The value of P_D is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The current rating is based on the DC thermal resistance rating.

1. Minimum footprint
2. Maximum footprint.

● **Electrical Characteristics** @ $T_A = 25^\circ\text{C}$ unless otherwise noted, no self-heating.

Parameter ⁽²⁾	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$	--	--	1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	--	--	± 10	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.6	0.78	1.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 7A$	--	18	22	mR
		$V_{GS} = 4.5V, I_D = 6A$	--	20	24	
		$V_{GS} = 2.5V, I_D = 5A$	--	24	28	
		$V_{GS} = 1.8V, I_D = 4A$	--	30	45	
Forward Transconductance	G_{FS}	$V_{DS} = 5V, I_D = 2.5A$	--	11	--	S
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = 2A, V_{GS} = 0V$	0.5	--	1.2	V
Input Capacitance	C_{ISS}	$V_{DS} = 10V, V_{GS} = 0V$ $F = 1.0\text{MHz}$	--	373	--	pF
Output Capacitance	C_{OSS}		--	138	--	
Reverse Transfer Capacitance	C_{RSS}		--	52	--	
Total Gate Charge	Q_G	$V_{DS} = 10V, I_D = 2.6A,$ $V_{GS} = 5V$	--	9.2	--	nC
Gate-Source Charge	Q_{GS}		--	2.7	--	
Gate-Drain	Q_{GD}		--	3.7	--	
Turn-On Delay Time	$T_{D(ON)}$	$V_{GS} = 5V, V_{GS} = 10V$	--	--	18	ns
Turn-Off Delay Time	$T_{D(OFF)}$	$R_L = 1.5R, R_{GEN} = 3R$	--	--	70	



● Typical Performance Characteristics

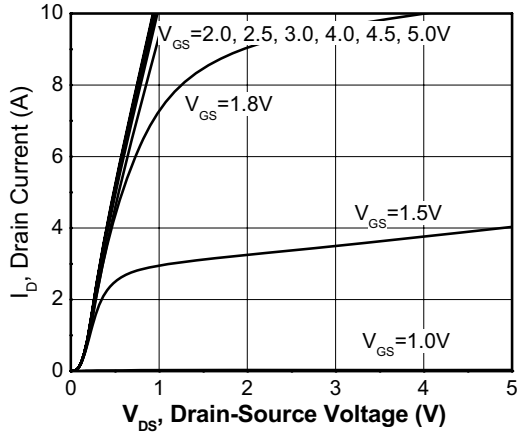


Fig1. Output Characteristics

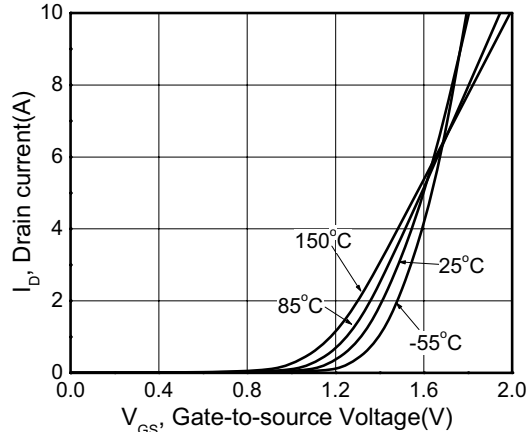


Fig2. Transfer Characteristics

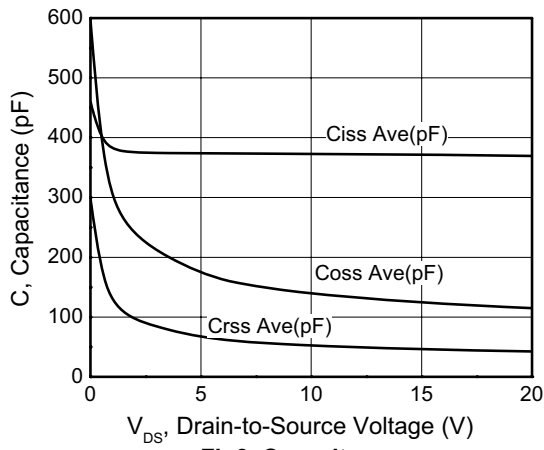


Fig3. Capacitance

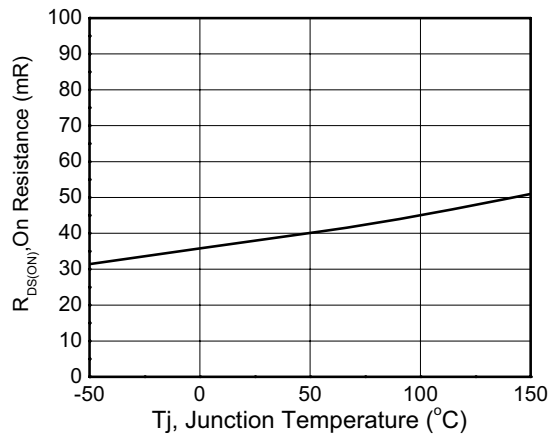


Fig4. On-Resistance vs. Temperature

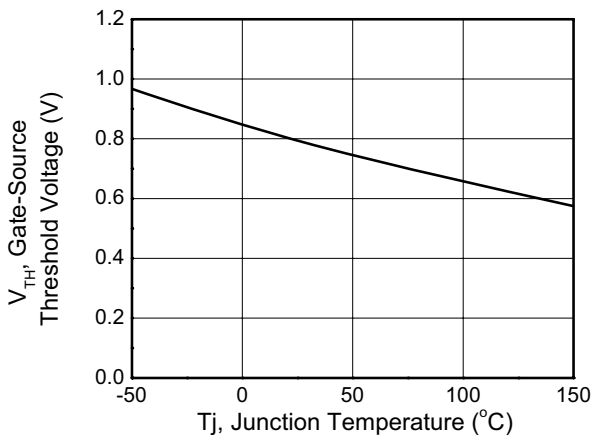


Fig5. Gate Threshold vs. Temperature

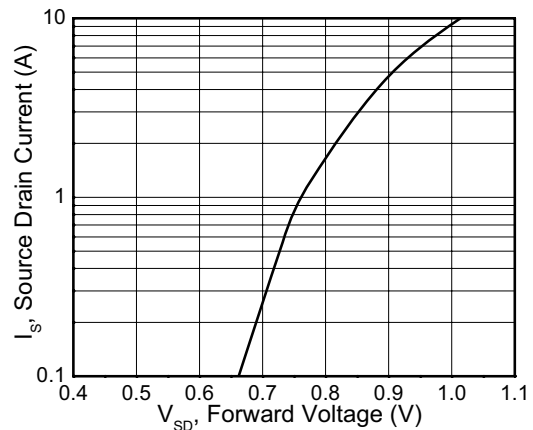


Fig6. Body Diode Forward Characteristics



DISCLAIMER

HUAXIN RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. HUAXIN DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G., OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.