KST3416

20V N-Channel MOSFET

General Description

The KST3416 uses advanced trench technology to provide excellent R_{DS}(ON), low gate charge and operation with gate voltages . This device is suitable for use as a load switch or in PWM applications. It is ESD protected..

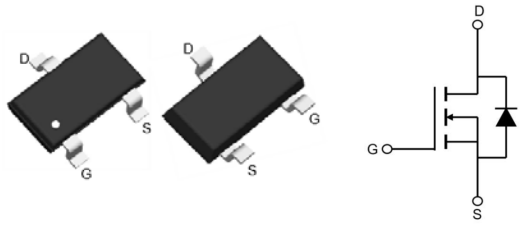
Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
20	22 at V_{GS} = 4.5V	6.0
	26 at V_{GS} = 2.5 V	5.3

Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

SOT-23 Pin Configuration



Applications

- PWM applications
- Load switch Power
- management

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D	Drain Current – Continuous (T_C=25℃)	6.0	A
	Drain Current – Continuous (T_C=100℃)	3.8	A
I_{DM}	Drain Current – Pulsed[1]	29	A
P_D	Power Dissipation (T_C=25℃)	1.2	W
	Power Dissipation (T_C=100℃)	0.01	W/℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.2	℃/W

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=20V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=5A	---	18	22	mΩ
		V_{GS}=2.5V , I_D=3A	---	21	26	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.40	0.7	1.1	V
gfs	Forward Transconductance	V_{DS}=5V , I_S=3A	---	40	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=4.5V , V_{GS}=10V , I_D=4A	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	3.1	---	
Q_{gd}	Gate-Drain Charge		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=10V,R_L=1.5Ω V_{GS}=4.5V,R_G=3Ω	---	260	---	ns
T_r	Rise Time		---	350	---	
$T_{d(off)}$	Turn-Off Delay Time		---	3.2	---	
T_f	Fall Time		---	2.7	---	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , F=1MHz	---	1030	---	pF
C_{oss}	Output Capacitance		---	155	---	
C_{rss}	Reverse Transfer Capacitance		---	80	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	5	A
I_{SM}	Pulsed Source Current		---	---	18	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	V

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics (Curves)

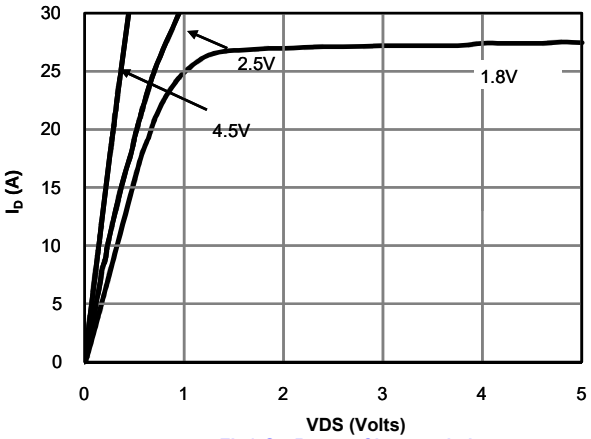


Fig1:On-Regon Characteristics

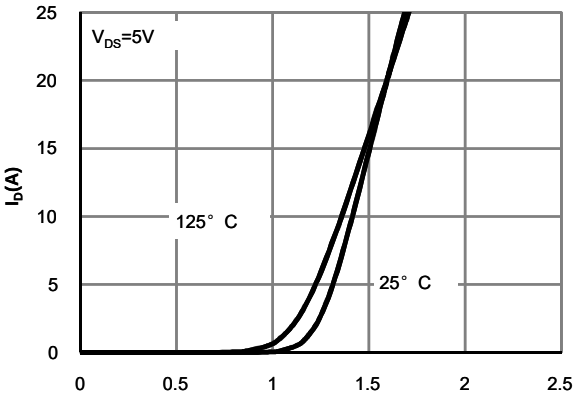


Figure 2:Transfer Characteristics

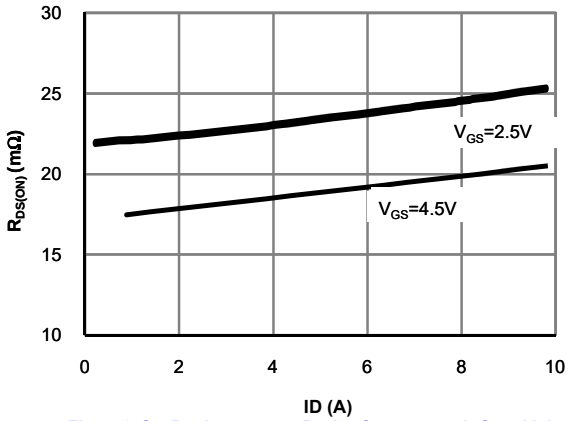


Figure3:On-Resistance vs.Drain Current and Gate Voltage

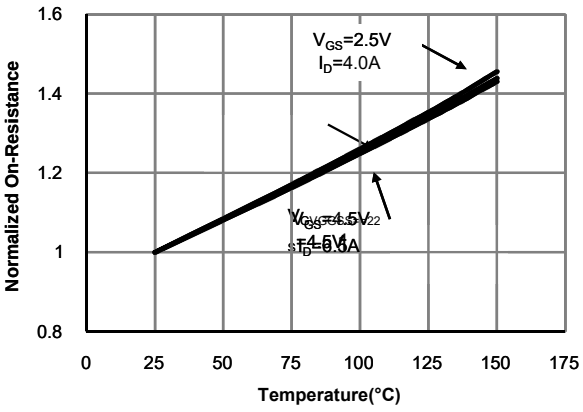


Figure4: On-Resistance vs. Junctioemperature

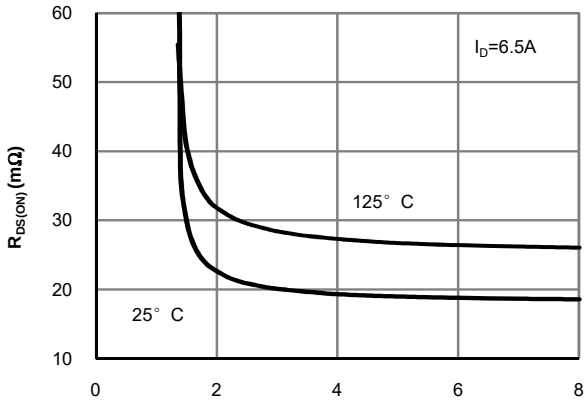


Figure 5: On-Resistance vs. Gate-Source Voltage

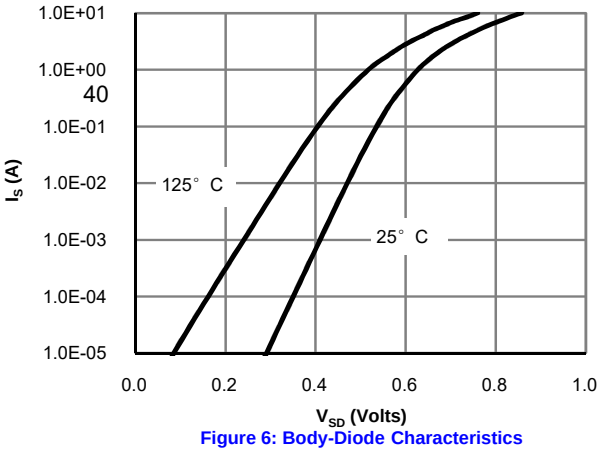


Figure 6: Body-Diode Characteristics

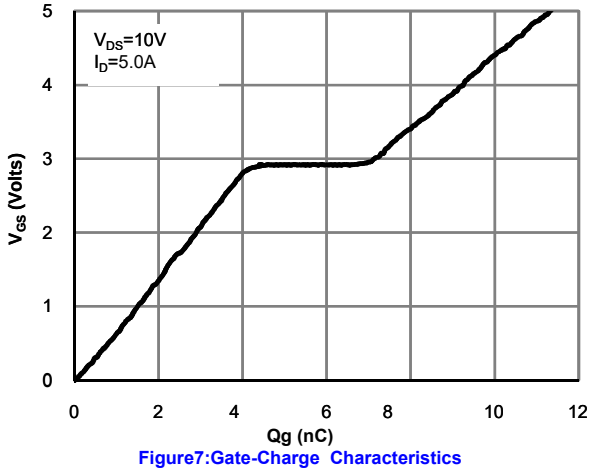


Figure7:Gate-Charge Characteristics

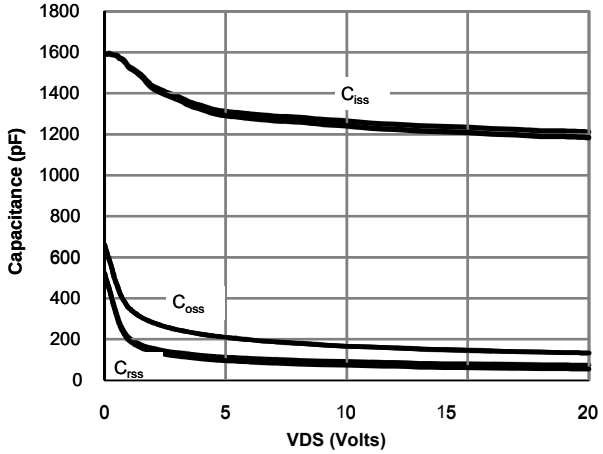


Figure 8:Capacitance Characteristics

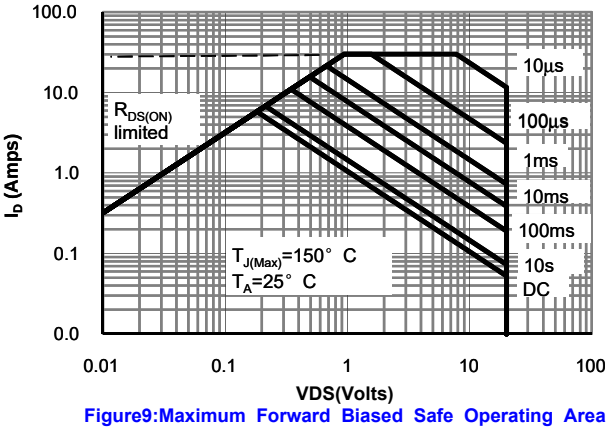


Figure9:Maximum Forward Biased Safe Operating Area

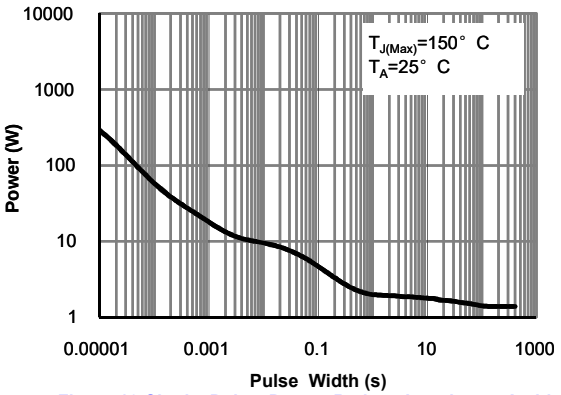


Figure 10:Single Pulse Power Rating Junction-to-Ambient

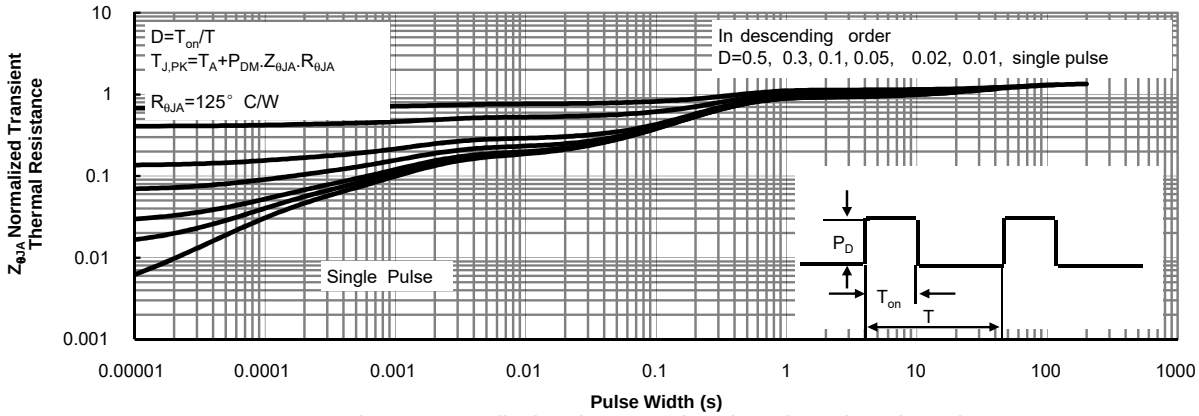


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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