KERSMI ELECTRONIC CO.,LTD.

600V N-channel MOSFET

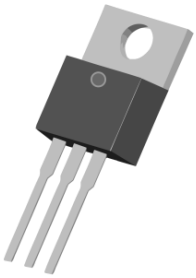
Description

This N-channel MOSFETS use advanced trench technology and design to provide excellent RDS(on) with low gate charge. It can be used in a wide variety of applications.

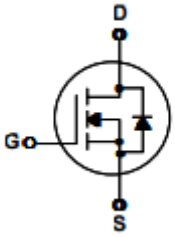
Features

BVDSS	RDSON	ID
600V	0.75Ω	12A

1) Low gate charge.
2) Green device available.
3) Advanced high cell denity trench technology for ultra RDS(ON)
4) Excellent package for good heat dissipation.



TO-220



Absolute Maximum Ratings T_C=25℃,unless otherwise noted

Symbol	Parameter	Ratings	Units
VDS	Drain-Source Voltage	600	V
VGS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current-1	12	A
	Continuous Drain Current-T=100℃	7.4	
	Pulsed Drain Current2	48	
EAS	Single Pulse Avalanche Energy3	225	mJ
PD	Power Dissipation4	225	W
TJ, TSTG	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics

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Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case1	0.56	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient1	62.5	

Package Marking and Ordering Information

Part NO.	Marking	Package
KSM12N60	KSM12N60	TO-220

Electrical Characteristics T_C=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{DS}=0V,I_D=250μA	600	—	—	v
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=0V, V_{DS}=32V	—	—	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS}=±20V, V_{DS}=0A	—	—	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{DS}=VDS, I_D=250μA	2.0	—	4.0	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{DS}=10V,I_D=6A	—	0.53	0.75	Ω
		V_{DS}=2.5V,I_D=5A	—	—	—	---
G_{FS}	Forward Transconductance	V_{DS}=5V,I_D=12A	—	13	—	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz	—	1760	2290	pF
C_{oss}	Output Capacitance		—	182	235	
C_{rss}	Reverse Transfer Capacitance		—	21	28	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=20V, V_{GS}=10V,R_{GEN}=3.3Ω	—	30	70	ns
t_r	Rise Time		—	85	180	ns
$t_{d(off)}$	Turn-Off Delay Time		—	155	120	ns
t_f	Fall Time		—	90	190	ns
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=20V, I_D=6A	—	48	63	nC
Q_{gs}	Gate-SourceCharge		—	8.5	—	nC
Q_{gd}	Gate-Drain “Miller” Charge		—	21	—	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode ForwardVoltage[2]	V_{GS}=0V,I_S =1A	—	—	1.4	V
t_{rr}	Reverse Recovery Time	I_F=7A,di/dt=100A/μS	—	420	—	ns
Q_{rr}	Reverse Recovery Charge		—	4.9	—	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board 2OZ copper.
2. The data tested by pulsed,pulse width≤300us,duty cycle≤2%
3. The EAS data shows Max.rating.The test condition is V_{DD}=25v,V_{GS}=10V,L=0.1mH,I_{AS}=17.8A
4. The power dissipation is limited by 150℃ junction temperature.

Typical Characteristics T_J=25℃ unless otherwise noted

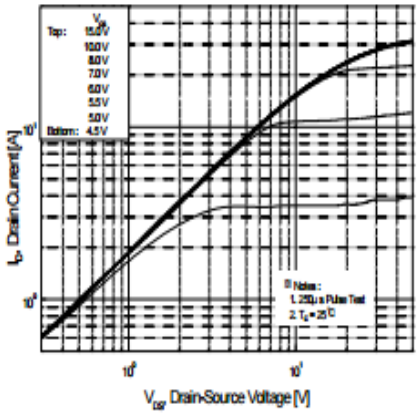


Figure 1. On-Region Characteristics

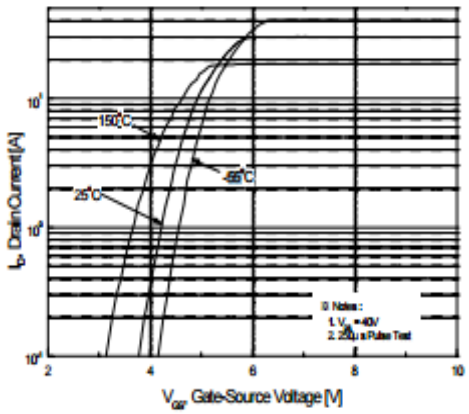


Figure 2. Transfer Characteristics

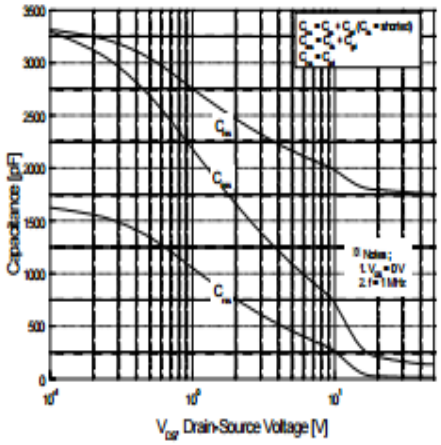


Figure 3. Capacitance Characteristics

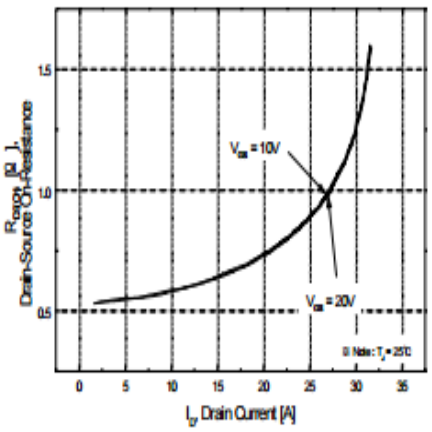


Figure 4. On-Resistance Variation vs Drain Current and Gate Voltage

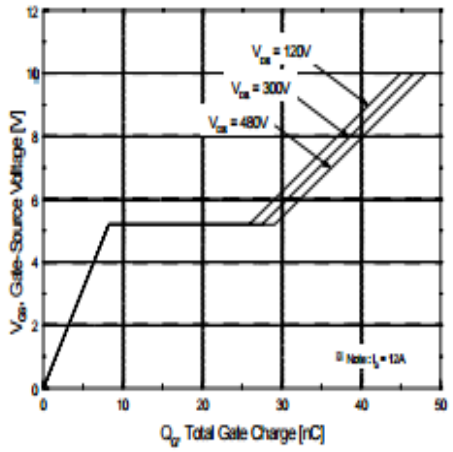


Figure 5. Gate Charge Characteristics

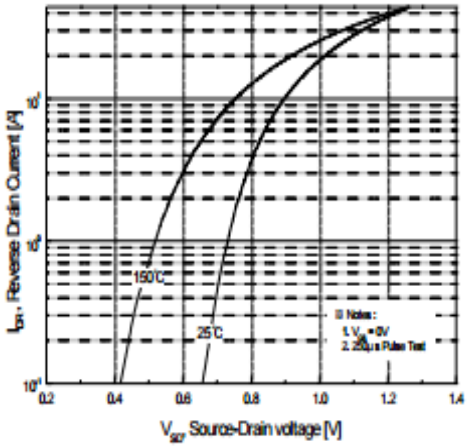


Figure 6. Body Diode Forward Voltage Variation vs. Source Current and Temperature

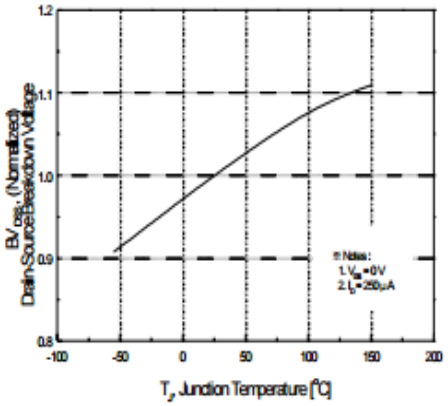


Figure 7.Breakdown Voltage Variation vs. Temperature

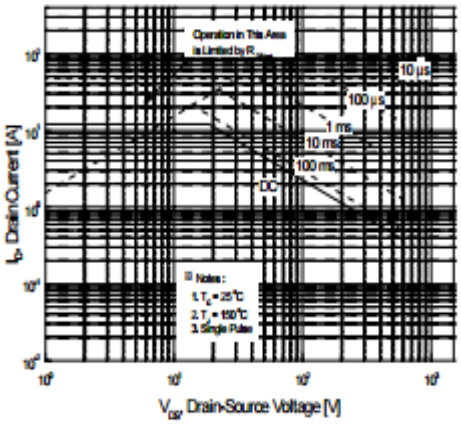


Figure 8.Maximum Safe Operating Area

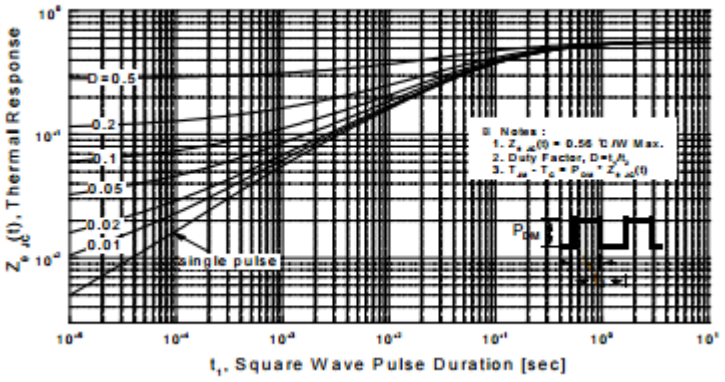


Figure 9. Transient Thermal Response Curve