

**KERSEMI ELECTRONIC CO.,LTD.**

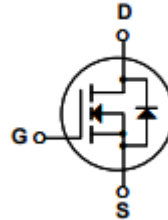
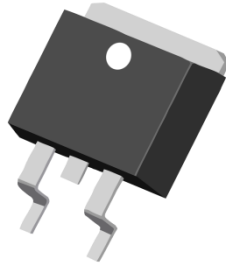
## Description

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	RDS(ON)	ID
600V	3.5Ω	3A

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



TO-263

## Absolute Maximum Ratings $T_c=25^{\circ}\text{C}$ , unless otherwise noted

Symbol	Parameter	Ratings	Units
VDS	Drain-Source Voltage	600	V
VGS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current-1	3.0	A
	Continuous Drain Current-T=100°C	1.9	
	Pulsed Drain Current <sup>2</sup>	12	
EAS	Single Pulse Avalanche Energy <sup>3</sup>	200	mJ
PD	Power Dissipation <sup>4</sup>	75	W
TJ, TSTG	Operating and Storage Junction Temperature Range	-55 to +150	°C

## Thermal Characteristics

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Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case1	1.67	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient1	62.5	

## Package Marking and Ordering Information

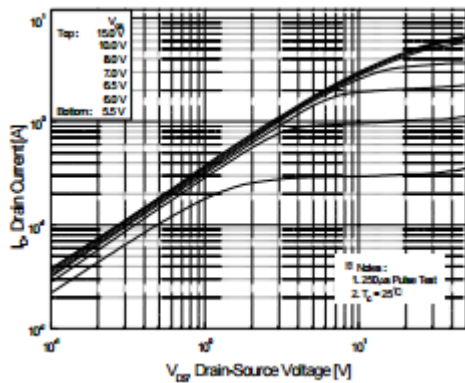
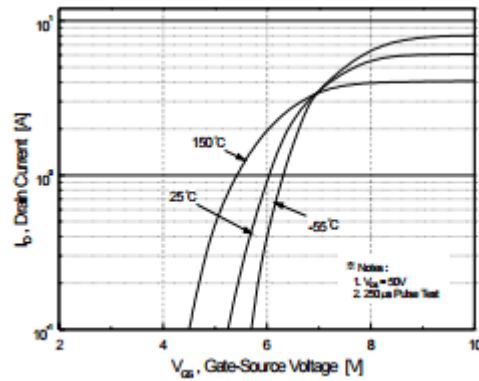
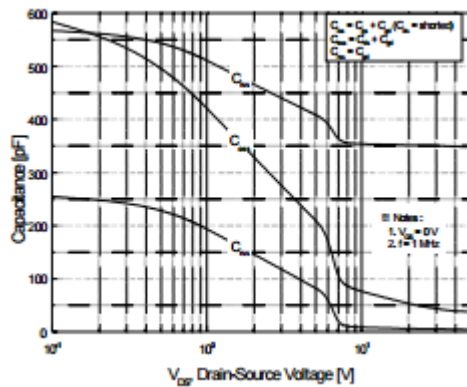
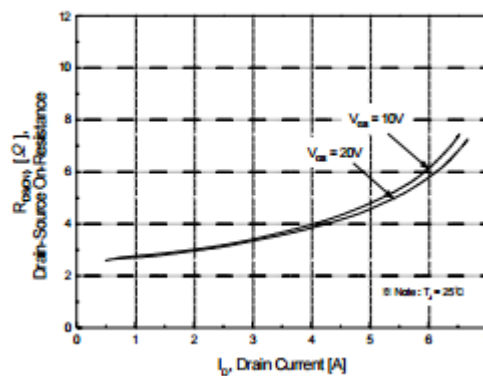
Part NO.	Marking	Package
KSMB3N60	KSMB3N60	TO-263

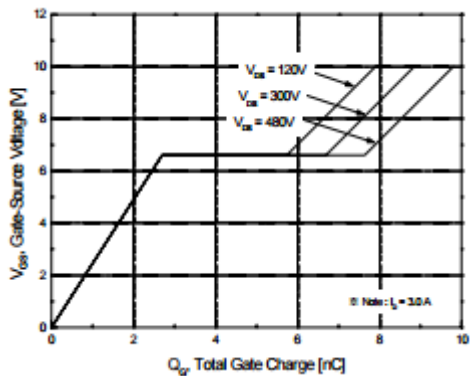
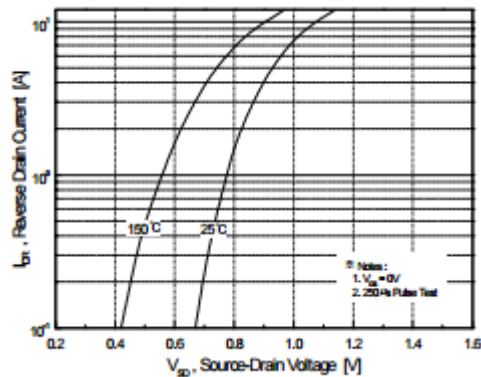
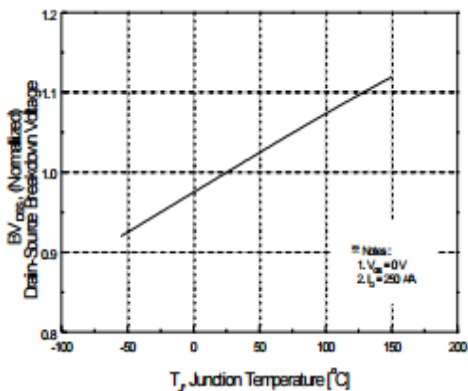
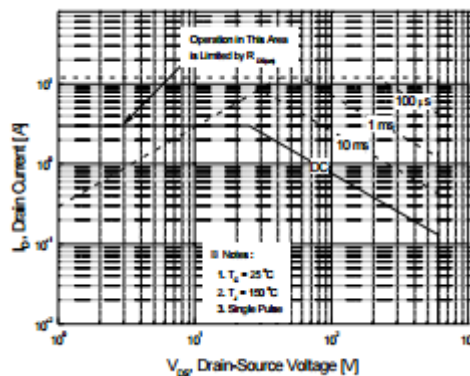
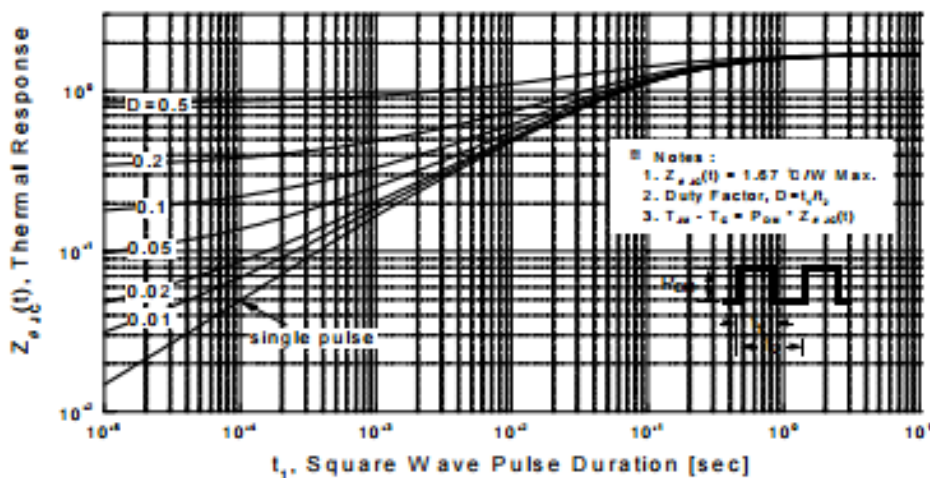
## Electrical Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{DS}=0V, I_D=250\mu A$	600	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=0V, V_{GS}=32V$	—	—	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{DS}=\pm 20V, V_{GS}=0A$	—	—	$\pm 10$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{DS}=V_{DS}, I_D=250\mu A$	3.0	—	5.0	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>2</sup>	$V_{DS}=10V, I_D=6A$	—	2.8	3.5	$\Omega$
		$V_{DS}=2.5V, I_D=5A$	—	—	—	
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=12A$	—	2.6	—	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V,$ $f=1MHz$	—	350	450	pF
$C_{oss}$	Output Capacitance		—	50	65	
$C_{rss}$	Reverse Transfer Capacitance		—	5.5	7.5	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V,$ $V_{GS}=10V, R_{GEN}=3.3\Omega$	—	10	30	ns
$t_r$	Rise Time		—	30	70	ns
$t_{d(off)}$	Turn-Off Delay Time	$V_{GS}=4.5V, V_{DS}=20V,$ $I_D=6A$	—	20	50	ns
$t_f$	Fall Time		—	30	70	ns
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=20V,$ $I_D=6A$	—	10	13	nC
$Q_{gs}$	Gate-Source Charge		—	2.7	—	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		—	4.9	—	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A$	—	—	1.4	V
$t_{rr}$	Reverse Recovery Time	$I_F=7A, di/dt=100A/\mu S$	—	210	—	ns
$Q_{rr}$	Reverse Recovery Charge		—	1.2	—	nC

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**Notes:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board 2OZ copper.
2. The data tested by 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°C junction temperature.

**Typical Characteristics  $T_J=25^\circ C$  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**

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**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**