

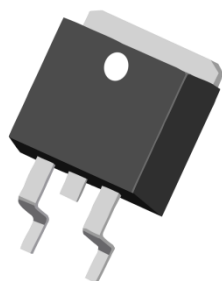
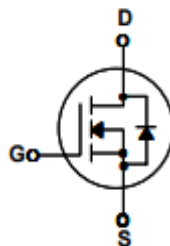
Description

This N-channel MOSFETs use advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features

BVDSS	$R_{DS(on)}$	I_D
650V	1.0Ω	10A

- 1) Low gate charge.
- 2) Green device available.
- 3) Advanced high cell density trench technology for ultra $R_{DS(ON)}$
- 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	650	V
VGS	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-1	10	A
	Continuous Drain Current- $T=100^\circ\text{C}$	3.3	
	Pulsed Drain Current ²	38	
EAS	Single Pulse Avalanche Energy ³	700	mJ
PD	Power Dissipation ⁴	156	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

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Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Thermal Resistance ,Junction to Case1	0.8	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient1	62.5	

Package Marking and Ordering Information

Part NO.	Marking	Package
KSMB10N65	KSMB10N65	TO-263

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{DS} =0V, I _D =250μA	650	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =0V, V _{GS} =32V	—	—	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =±20V, V _{GS} =0A	—	—	±100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{DS} =V _{DS} , I _D =250μA	2.0	—	4.0	V
R _{DS(on)}	Drain-Source On Resistance ²	V _{DS} =10V, I _D =6A	—	0.6	1.0	Ω
		V _{DS} =2.5V, I _D =5A	—	—	—	---
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =12A	—	8.0	—	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	—	1570	2040	pF
C _{oss}	Output Capacitance		—	166	215	
C _{rss}	Reverse Transfer Capacitance		—	18	24	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =20V, V _{GS} =10V, R _{GEN} =3.3Ω	—	23	55	ns
t _r	Rise Time		—	69	150	ns
t _{d(off)}	Turn-Off Delay Time		—	144	300	ns
t _f	Fall Time		—	77	165	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =20V, I _D =6A	—	44	57	nC
Q _{gs}	Gate-Source Charge		—	6.7	—	nC
Q _{gd}	Gate-Drain “Miller” Charge		—	18.5	—	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage 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		—	4.2	—	nC

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Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board 2OZ copper.
2. The data tested by pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
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 $^{\circ}C$ junction temperature.

Typical Characteristics $T_J=25^{\circ}C$ unless otherwise noted

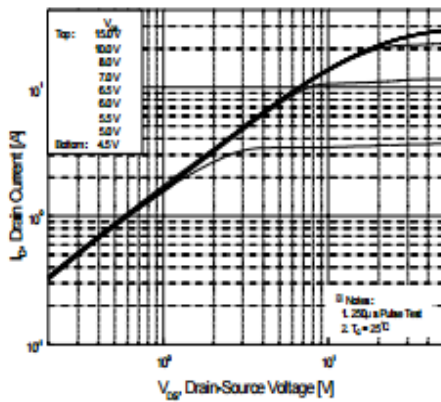


Figure 1. On-Region Characteristics

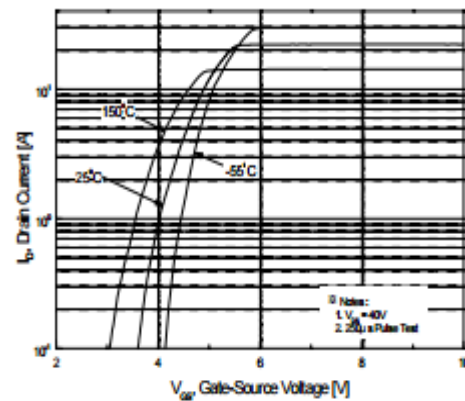


Figure 2. Transfer Characteristics

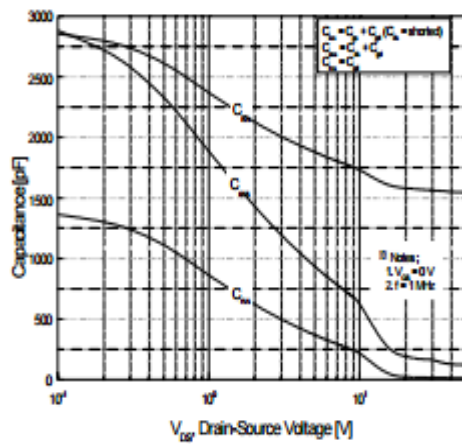


Figure 3. Capacitance Characteristics

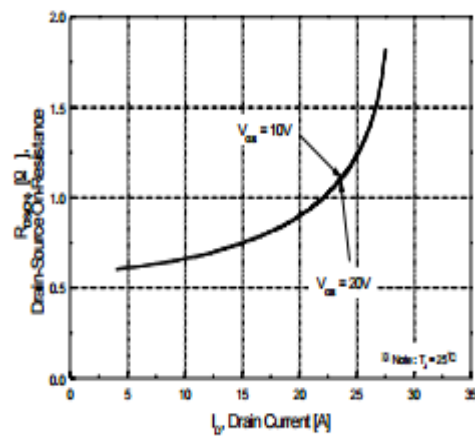


Figure 4. On-Resistance Variation vs. Drain Current and Gate Voltage

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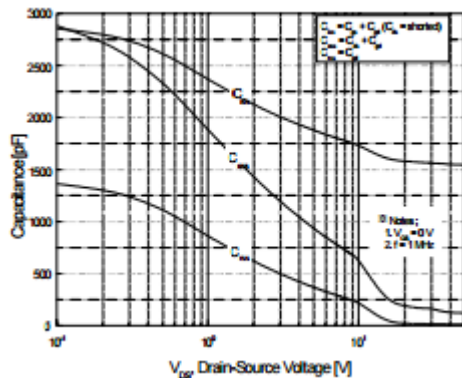


Figure 5. Gate Charge Characteristics

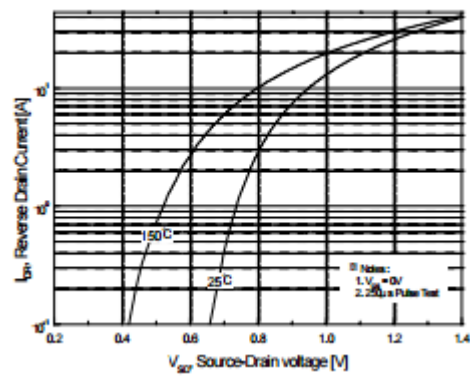


Figure 6. Body Diode Forward Voltage Variation vs. Source Current and Temperature

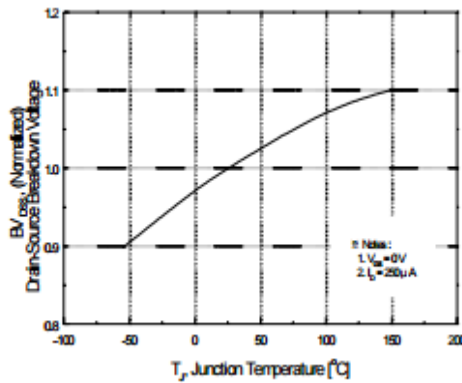


Figure 7. Breakdown Voltage Variation vs. Temperature

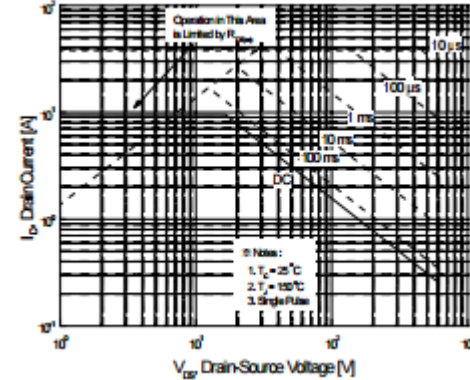


Figure 8. Maximum Safe Operating Area

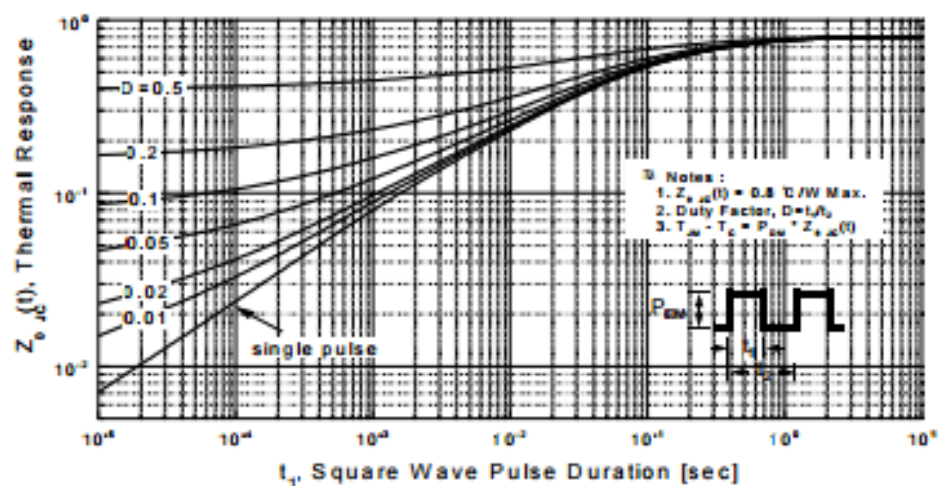


Figure 9. Transient Thermal Response Curve