

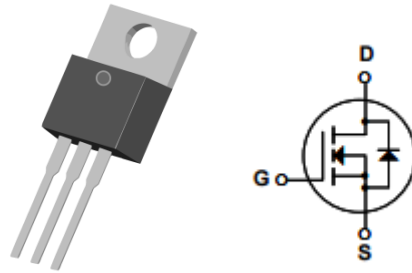
## Description

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
100V	7.0MΩ	140A

- 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-220

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

Symbol	Parameter	Ratings	Units
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current-1	140	A
	Continuous Drain Current-T=100°C	97	
	Pulsed Drain Current <sup>2</sup>	550	
EAS	Single Pulse Avalanche Energy <sup>3</sup>	—	mJ
PD	Power Dissipation <sup>4</sup>	330	W
TJ, TSTG	Operating and Storage Junction Temperature Range	-55 to +175	°C

## Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Thermal Resistance ,Junction to Case1	0.45	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient1	40	

## Package Marking and Ordering Information

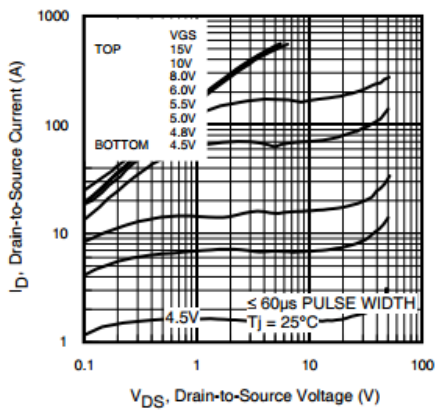
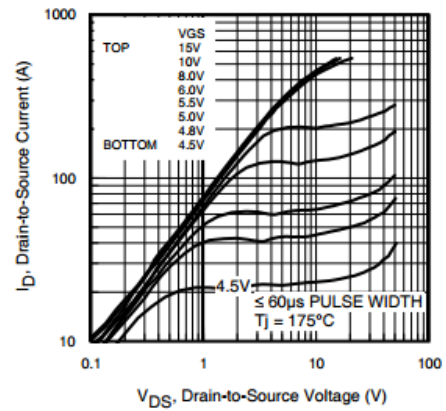
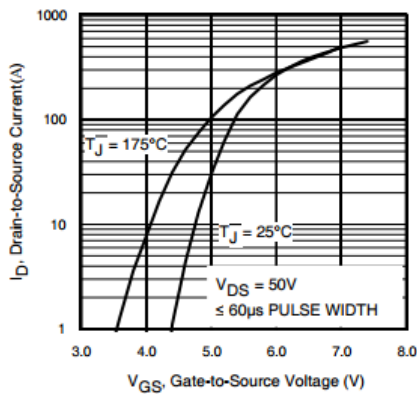
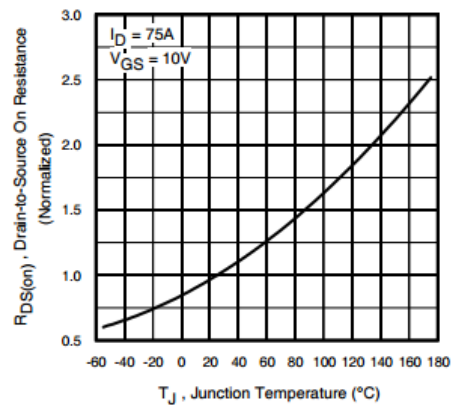
Part NO.	Marking	Package
KSM4310	KSM4310	TO-220

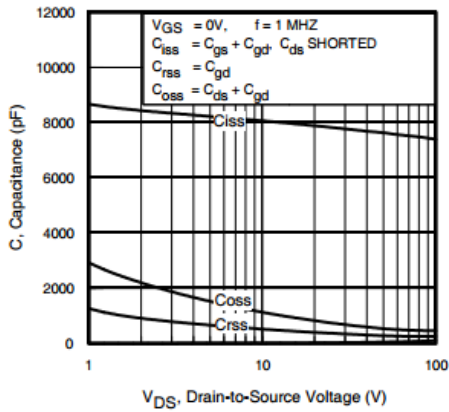
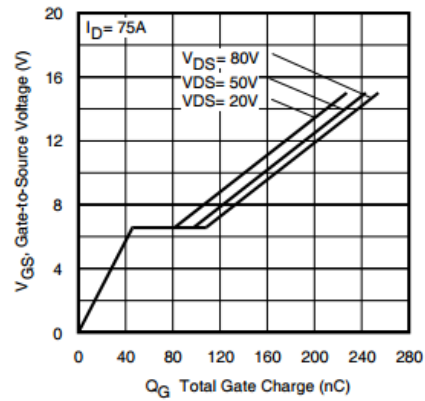
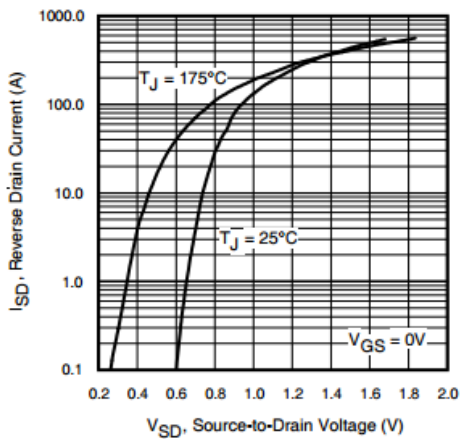
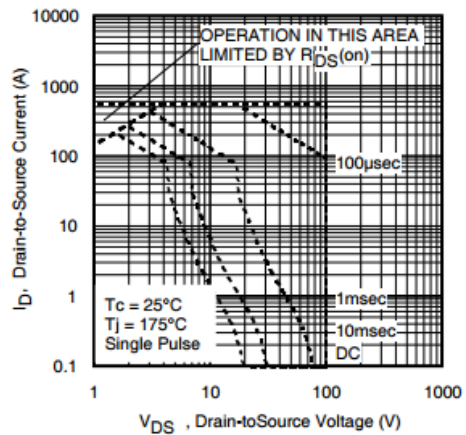
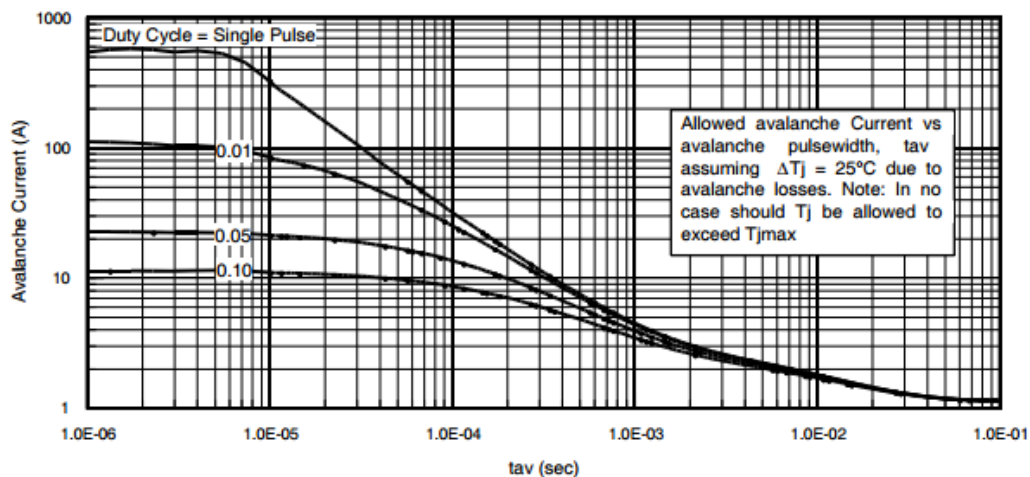
## Electrical Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{DS}=0V, I_D=250\mu A$	100	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=0V, V_{GS}=32V$	—	—	20	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{DS}=\pm 20V, V_{GS}=0A$	—	—	$\pm 200$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{DS}=V_{DS}, I_D=250\mu A$	2.0	—	4.0	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>2</sup>	$V_{DS}=10V, I_D=6A$	—	—	7.0	$M\Omega$
		$V_{DS}=2.5V, I_D=5A$	—	—	—	---
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=12A$	160	—	—	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V,$ $f=1MHz$	—	7670	—	pF
$C_{oss}$	Output Capacitance		—	540	—	
$C_{rss}$	Reverse Transfer Capacitance		—	280	—	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V,$ $V_{GS}=10V, R_{GEN}=3.3\Omega$	—	26	—	ns
$t_r$	Rise Time		—	110	—	ns
$t_{d(off)}$	Turn-Off Delay Time		—	68	—	ns
$t_f$	Fall Time		—	78	—	ns
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=20V,$ $I_D=6A$	—	170	250	nC
$Q_{gs}$	Gate-Source Charge		—	46	—	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		—	62	—	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A$	—	—	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_F=7A, di/dt=100A/\mu S$	—	45	63	ns
$Q_{rr}$	Reverse Recovery Charge		—	82	120	nC

**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  $\leq 300\mu s$ , duty cycles  $\leq 2\%$
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**

**Fig 1. Typical Output Characteristics**

**Fig 2. Typical Output Characteristics**

**Fig 3. Typical Transfer Characteristics**

**Fig 4. Normalized On-Resistance Vs. Temperature**


**Fig5. Typical Capacitance vs. Voltage**

**Fig6. Typical Gate Charge vs. Drain-to-Source Voltage**

**Fig 7. Typical Source-Drain Diode Forward Voltage**

**Fig 8. Maximum Safe Operating Area**


**Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case**