

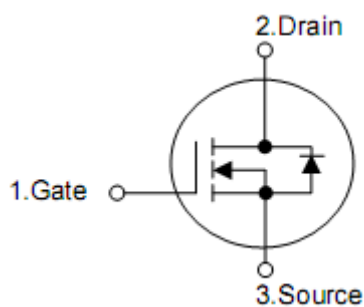
1. Features

- $R_{DS(ON)}=90m\Omega(\text{typ.}) @ V_{GS}=10V$
- Low gate charge(typ. $Q_g=57.7nC$)
- High ruggedness
- Ultra fast switching
- 100% avalanche tested
- Improved dv/dt capability

2. Pin configuration



TO-247



Pin	Function
1	Gate
2	Drain
3	Source

3. Ordering Information

Part Number	Package	Brand
KLM60R099B	TO-247	KIA

4. Absolute maximum ratings

(T_C=25°C, unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-to-Source Voltage		V _{DSS}	600	V
Gate-to-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current	T _C =25°C	I _D	35*	A
	T _C =100°C	I _D	23*	A
Pulsed Drain Current - Plus ¹⁾		I _{DM}	110*	A
Single Pulse Avalanche Energy ²⁾		E _{AS}	187	mJ
Avalanche Current ¹⁾		I _{AR}	5.4	A
Repetitive Avalanche Energy ¹⁾		E _{AR}	2.6	A
Peak Diode Recovery dv/dt ³⁾		dv/dt	50	V/ns
MOSFET dv/dt		dv/dt	100	V/ns
Power Dissipation	T _C =25°C	P _D	260	W
	Derating above 25°C	P _D	2.08	W/°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T _L	260	°C
Operating and Storage Temperature Range		T _J &T _{STG}	-55 to 150	°C

* Drain current limited by maximum junction temperature.

5. Thermal characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	0.48	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	°C/W

6. Electrical characteristics

 (T_C=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =1mA	600	-	-	V
		V _{GS} =0V, I _D =1mA T _J =150°C	650	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	-	-	10	uA
		V _{DS} =480V, T _C =125°C	-	60	-	uA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	3.0	-	5.0	V
Drain-to-Source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15.3A	-	90	105	mΩ
Gate Resistance	R _G	f=1MHz	-	1.1	-	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =400V, f=250KHZ	-	2200	-	pF
Reverse Transfer Capacitance	C _{oss}		-	50	-	
Output Capacitance	C _{rss}		-	-	-	
Total Gate Charge	Q _g	V _{DD} =400V, I _D =15.3A, V _{GS} =10V ^{4),5)}	-	56	-	nC
Gate-to-Source Charge	Q _{gs}		-	13	-	
Gate-to-Drain (Miller) Charge	Q _{gd}		-	28	-	
Turn-on Delay Time	t _{d(ON)}	V _{DS} =400V, I _D =15.3A, R _G =10Ω, V _{GS} =10V ^{4),5)}	-	20	-	nS
Rise Time	t _{rise}		-	10	-	
Turn-Off Delay Time	t _{d(OFF)}		-	75	-	
Fall Time	t _{fall}		-	8	-	
Maximum Continuous Drain-Source Diode Forward Current	I _S	--	-	-	35	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	--	-	-	110	A
Forward Voltage	V _{SD}	I _S =21.5A, V _{GS} =0V	-	-	1.2	V
Reverse recovery time	t _{rr}	I _S =21.5A, V _{DD} =400V dI _F /dt=100A/us ⁴⁾	-	139	-	ns
Reverse recovery charge	Q _{rr}		-	0.91	-	uC

Note:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature
- 2) I_{AS}=5.4A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C.
- 3) I_{SD}≤15.3A, di/dt≤100A/us, V_{DD}≤400, Starting T_J=25°C
- 4) Pulse Test: Pulse width≤300us, Duty cycle≤2%
- 5) Essentially independent of operating temperature

7. Test circuits and waveforms

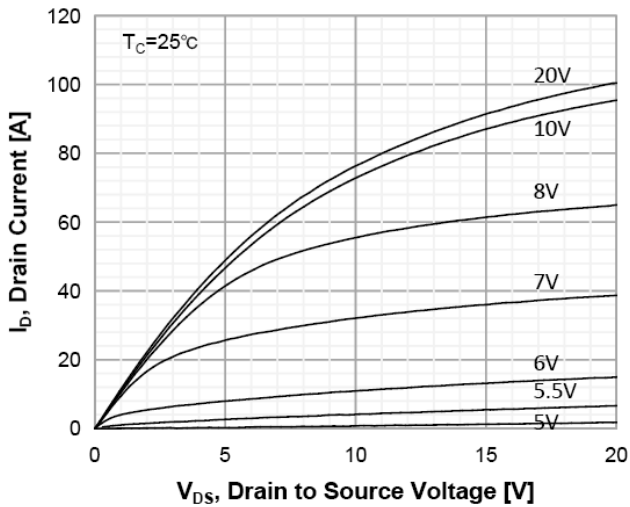


Figure 1. On-Region Characteristics

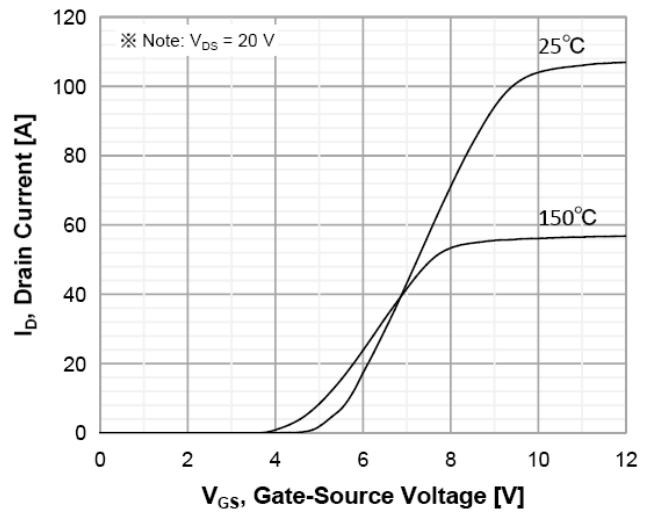


Figure 2. Transfer Characteristics

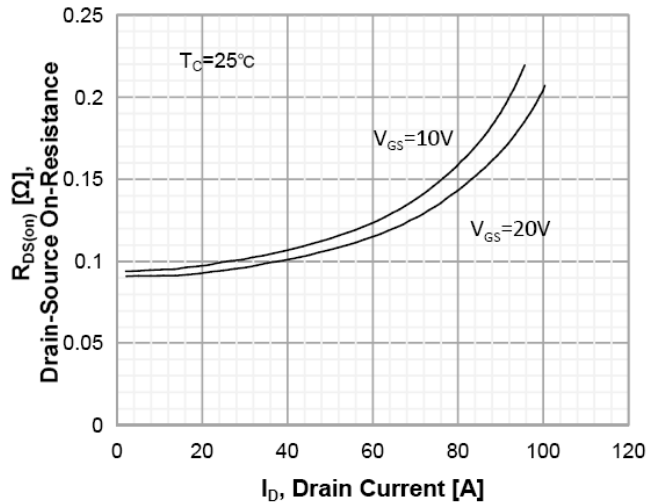


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

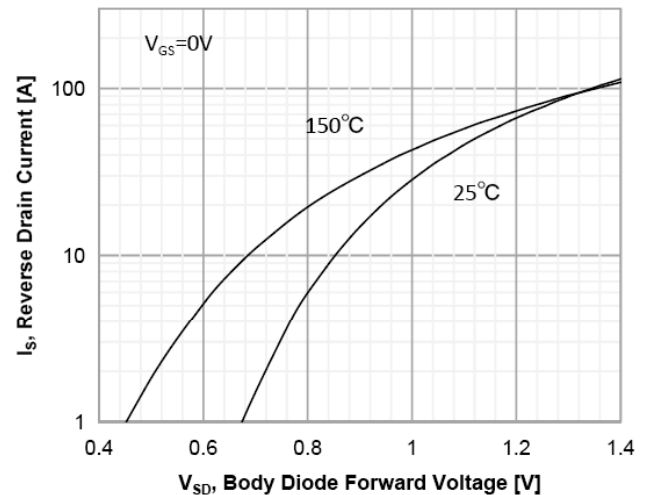


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

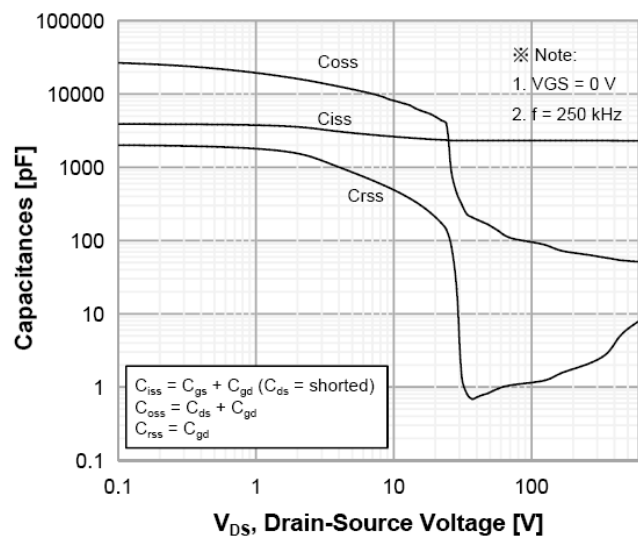


Figure 5. Capacitance Characteristics

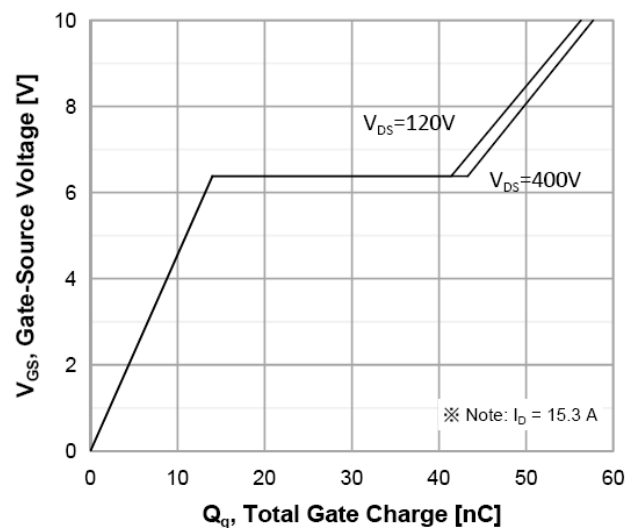


Figure 6. Gate Charge Characteristics

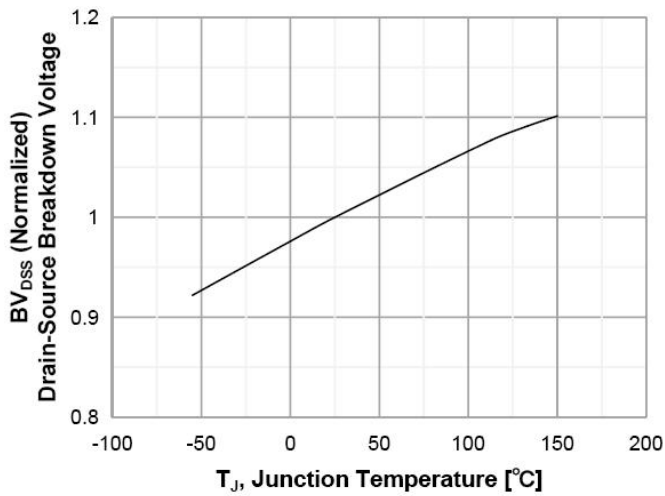


Figure 7. Breakdown Voltage Variation vs Temperature

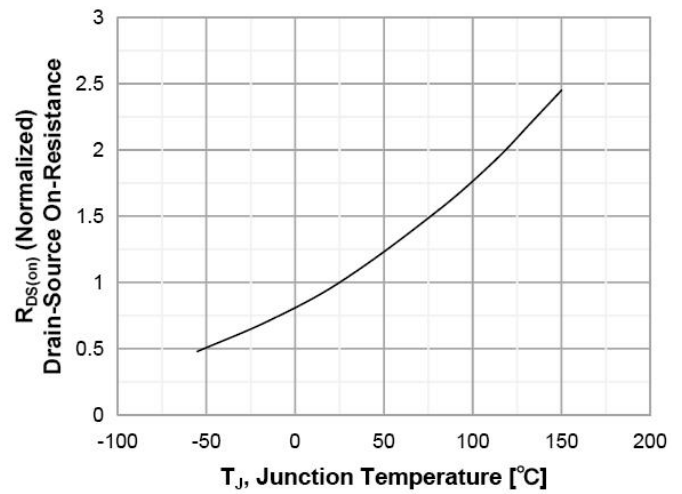


Figure 8. On-Resistance Variation vs Temperature

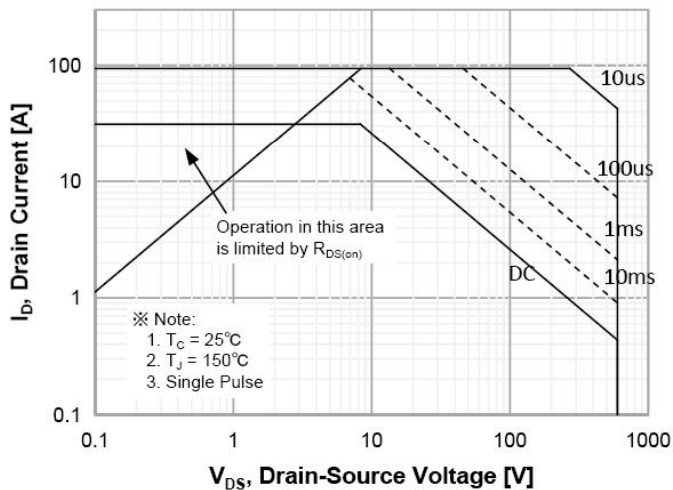


Figure 9. Maximum Safe Operating Area

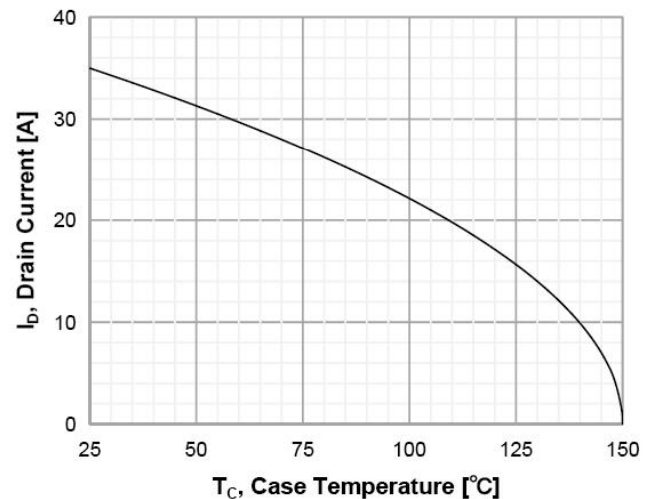


Figure 10. Maximum Drain Current vs. Case Temperature

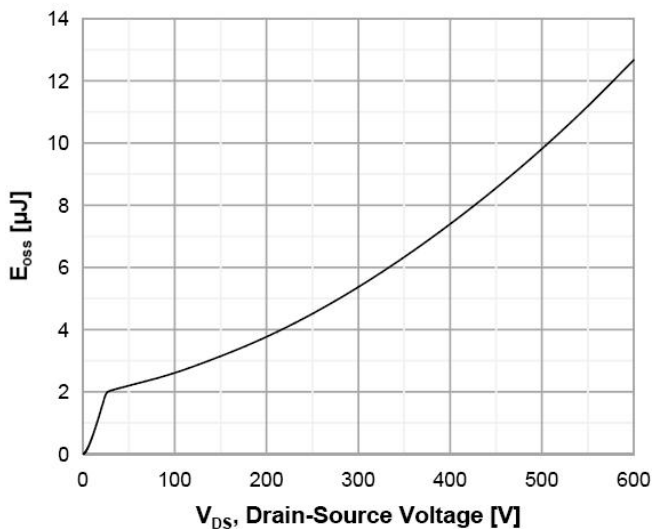


Figure 11. E_{oss} vs. Drain to Source Voltage

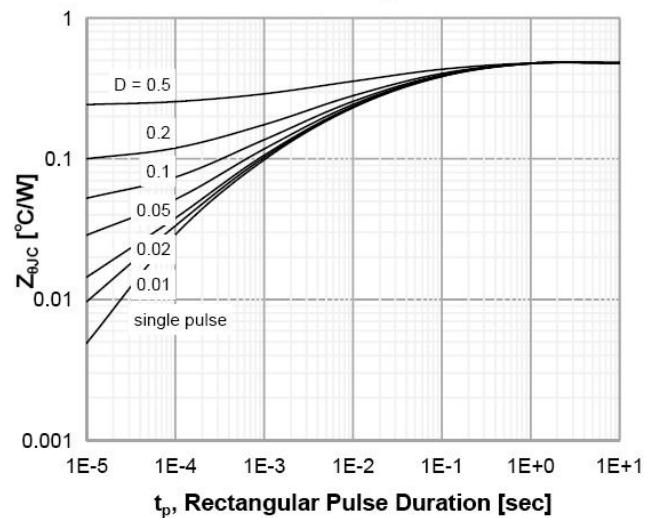
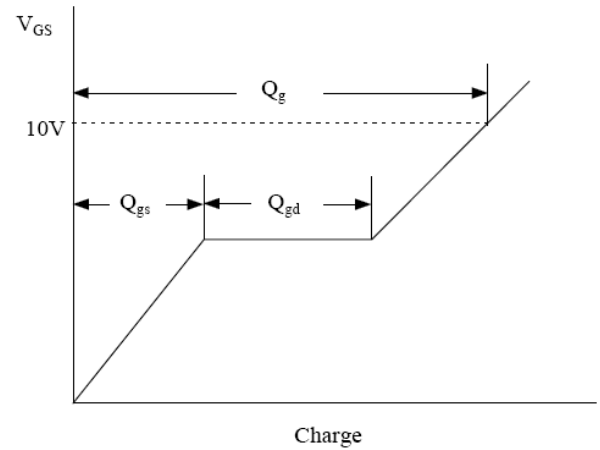
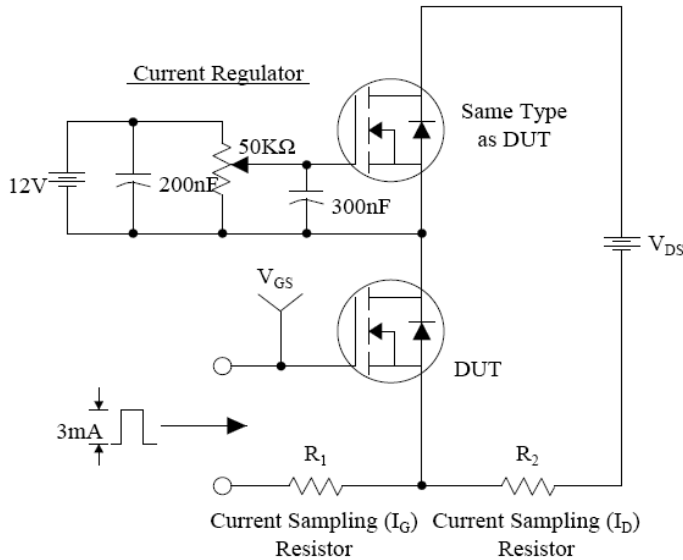


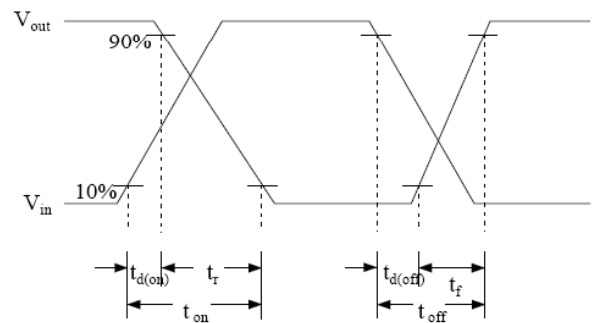
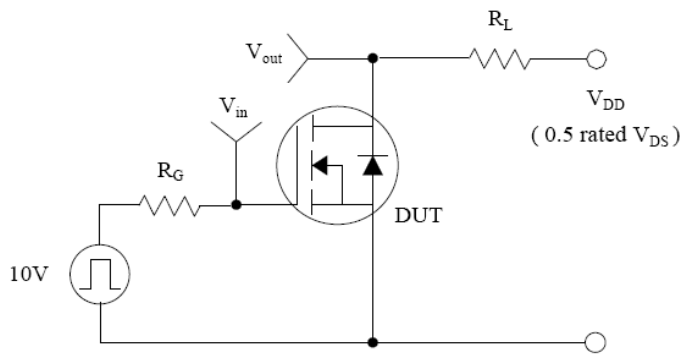
Figure 12. Transient Thermal Response Curve

8. Test Circuits and Waveforms

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

