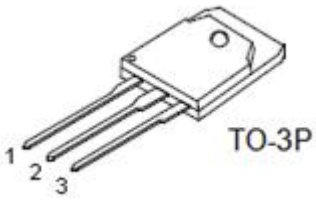
1. Description

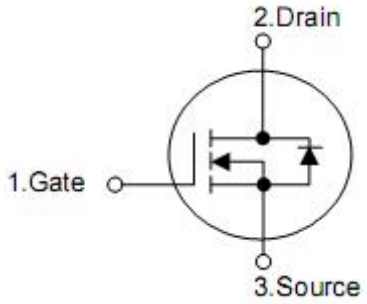
This Power MOSFET is produced using KIA advanced planar stripe DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

2. Features

- $R_{DS(ON)}$=0.16Ω@V_{GS}=10 V
- Low gate charge (typical 90nC)
- High ruggedness
- Fast switching
- 100%avalanche tested
- Improved dv/dt capability

3. Pin configuration





Pin	Function
1	Gate
2	Drain
3	Source

4. Absolute maximum ratings

(T_C= 25 ºC , unless otherwise specified)

Parameter		Symbol	Ratings	Units
Drain-source voltage		V_{DSS}	500	V
Gate-source voltage		V_{GSS}	±30	V
Drain currenet continuous	T_c=25°C	I_D	24	A
	T_c=100°C		15	A
Drain current pulsed (note1)		I_{DM}	96	A
Avalanche energy	Repetitive (note1)	E_{AR}	29	mJ
	Single pulse (note2)	E_{AS}	1150	mJ
Peak diode recovery dv/dt (note3)		dv/dt	4.5	V/ns
Total power dissipation	T_c=25°C	P_D	290	W
	Derate above 25°C		2.33	W/°C
Operating and storage temperature range		T_J, T_{STG}	-55~+150	°C
Maximum lead temperature for soldering purposes, 1/8”from case for 5 seconds		T_L	300	°C

5. Thermal characteristics

Parameter	Symbol	Typ	Max	Units
Thermal resistance junction-ambient	R_{thJA}	-	40	°C/W
Thermal resistance, case-to-sink typ.	R_{thCS}	0.24	-	
Thermal resistance junction-case	R_{thJC}	-	0.43	

6. Electrical characteristics

(T_J=25°C,unless otherwise noted)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Units
Off characteristics							
Drain-source breakdown voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	500	-	-	V
Zero gate voltage drain current		I_{DSS}	V_{DS}=500V,V_{GS}=0V	-	-	1	μA
			V_{DS}=400V,T_C=125℃	-	-	10	μA
Gate-body leakage current	Forward	I_{GSS}	V_{GS}=30V,V_{DS}=0V	-	-	100	nA
	Reverse		V_{GS}=-30V,V_{DS}=0V	-	-	-100	nA
Breakdown voltage temperature coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA, referenced to 25℃	-	0.5	-	V/°C
On characteristics							
Gate threshold voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.5	V
Static drain-source on-resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=12A	-	0.16	0.2	Ω
Dynamic characteristics							
Input capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	3500	-	pF
Output capacitance		C_{OSS}		-	520	-	pF
Reverse transfer capacitance		C_{RSS}		-	55	-	pF
Switching characteristics							
Turn-on delay time		$t_{D(ON)}$	V_{DD}=250V,I_D=24A, R_G=25Ω (note4,5)	-	100	-	ns
Rise time		t_R		-	250	-	ns
Turn-off delay time		$t_{D(OFF)}$		-	200	-	ns
Fall time		t_F		-	150	-	ns
Total gate charge		Q_G	V_{DS}=400V, I_D=24A, V_{GS}=10V (note4,5)	-	90	-	nC
Gate-source charge		Q_{GS}		-	22	-	nC
Gate-drain charge		Q_{GD}		-	45	-	nC
Drain-source diode characteristics							
Drain-source diode forward voltage		V_{SD}	V_{GS}=0V,I_{SD}=24A	-	-	1.5	V
Continuous drain-source current		I_S		-	-	24	A
Pulsed drain-source current		I_{SM}		-	-	96	A
Reverse recovery time		t_{RR}	V_{GS}=0V,I_S=24A, dI_F/dt=100A/μs (note4)	-	400	-	ns
Reverse recovery charge		Q_{RR}		-	4.3	-	μC

Note：1. Repetitive rating : pulse width limited by maximum junction temperature

2. L= 3.4mH, I_{AS}= 24A, V_{DD}=50V, R_G= 25Ω, starting T_J=25°C

3. I_{SD}≤24A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, starting T_J=25°C

4. Pulse test : pulse width≤300μs, duty cycle≤2%

5. Essentially independent of operating temperature

7. Test circuits and waveforms

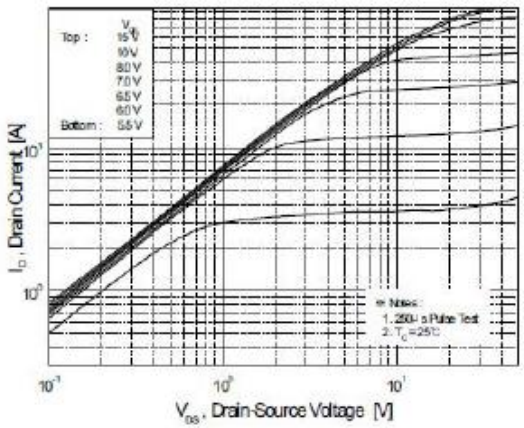


Figure 1. On-Region Characteristics

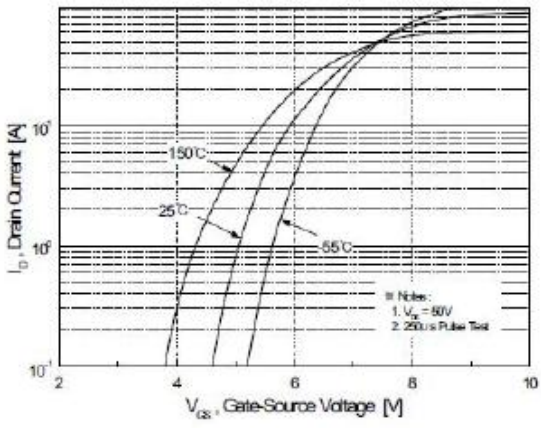


Figure 2. Transfer Characteristics

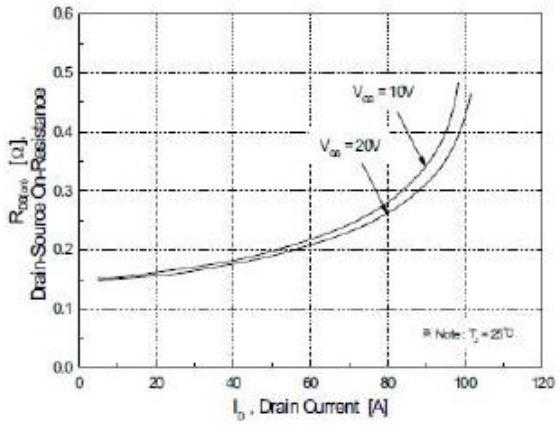


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

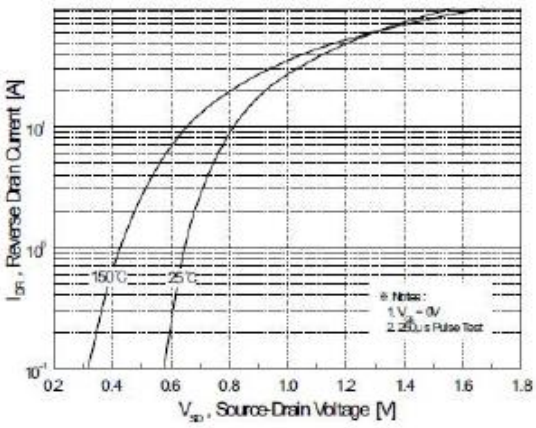


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

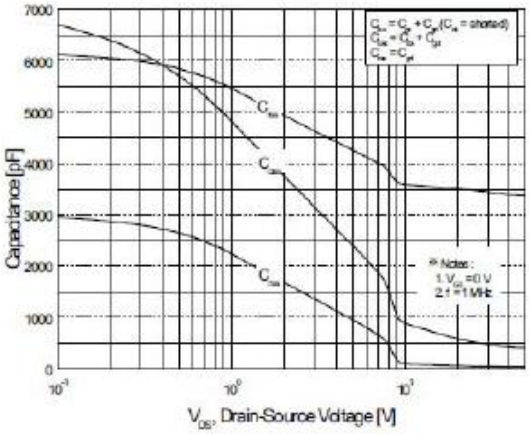


Figure 5. Capacitance Characteristics

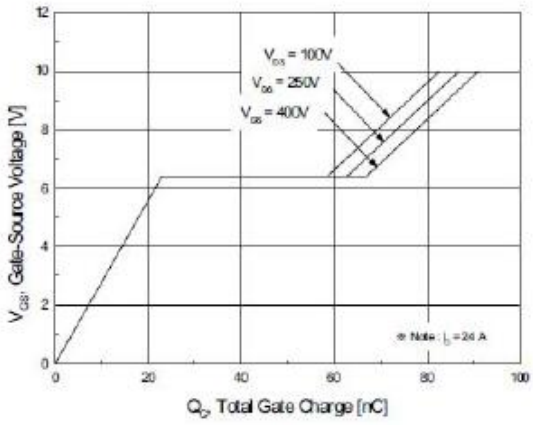


Figure 6. Gate Charge Characteristics

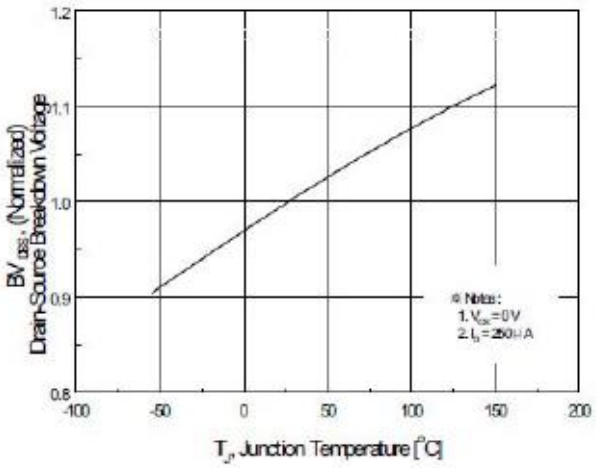


Figure 7. Breakdown Voltage Variation vs. Temperature

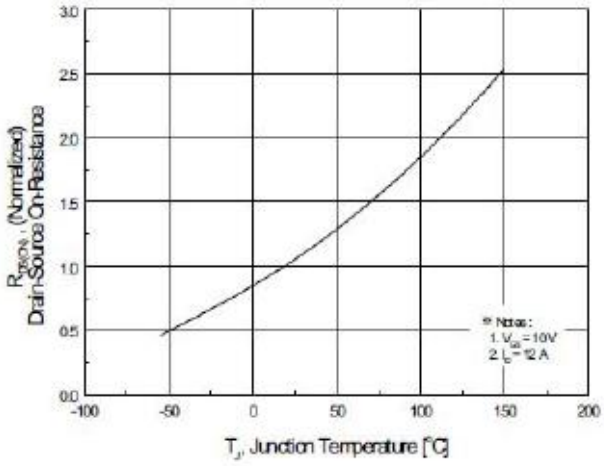


Figure 8. On-Resistance Variation vs. Temperature

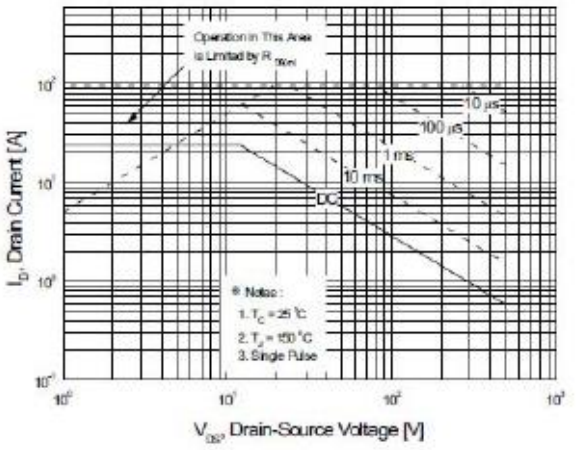


Figure 9. Maximum Safe Operating Area

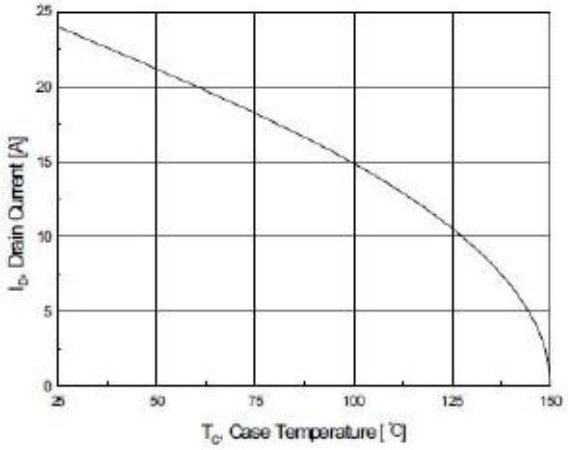


Figure 10. Maximum Drain Current vs. Case Temperature

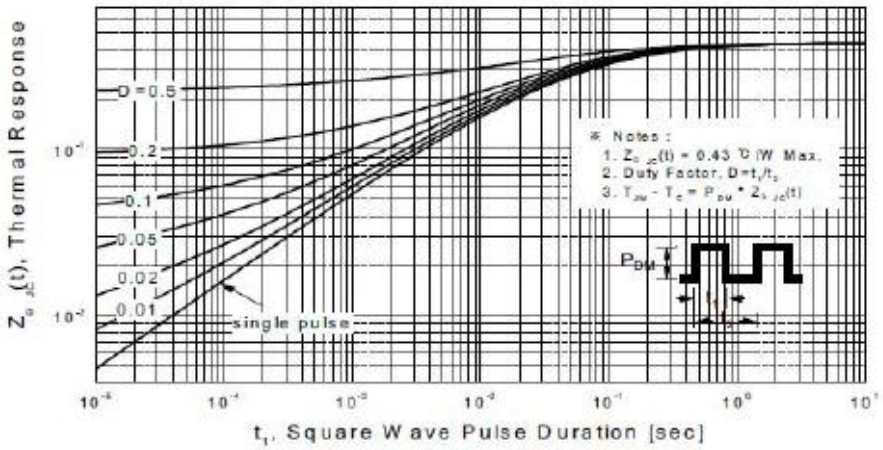


Figure 11. Transient Thermal Response Curve