

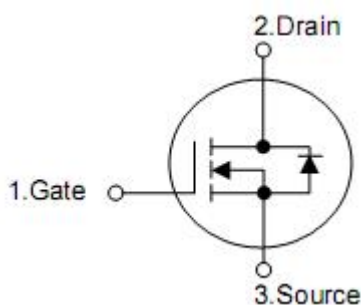
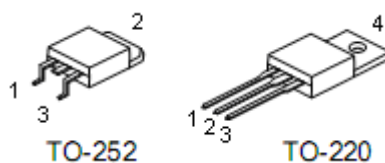
## 1. Description

This Power MOSFET is produced using KIA's 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

- n  $R_{DS(ON)}=0.6\Omega(\text{typ.})@V_{GS}=10V$ .
- n Low gate charge (typical 15nC)
- n High ruggedness
- n Fast switching capability
- n Avalanche energy specified
- n Improved dv/dt capability

## 3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

## 4. Absolute maximum ratings

( $T_C = 25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Rating		Units
		TO-220	TO-252	
Drain-source voltage	$V_{DSS}$	350		V
Gate-source voltage	$V_{GSS}$	$\pm 20$		V
Drain current continuous	$T_C = 25^\circ\text{C}$	11	11*	A
	$T_C = 100^\circ\text{C}$	6.6	6.6*	A
Drain current pulsed (note1)	$I_{DM}$	36		A
Avalanche Enlsted	Repetitive (note1)	$E_{AR}$		mJ
	Single pulse (note2)	$E_{AS}$		mJ
Avalanche current (note 1)	$I_{AR}$	9.0		A
Peak diode recovery dv/dt (note3)	dv/dt	4.5		V/ns
Total power dissipation	$T_C = 25^\circ\text{C}$	99		W
	Derate above $25^\circ\text{C}$	0.79		W/°C
Operating and storage temperature range	$T_J, T_{STG}$	-55~+150		°C
Maximum lead temperature for soldering Purposes, 1/8" form case for 5 seconds	$T_L$	300		°C

\*Drain current limited by maximum junction temperature.

## 5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance, Junction-ambient	$R_{thJA}$	62.5	°C/W
Thermal resistance, case-to-sink typ.	$R_{thJS}$	0.5	°C/W
Thermal resistance, Junction-case	$R_{thJC}$	1.26	°C/W

## 6. Electrical characteristics

(T<sub>C</sub>= 25 °C, unless otherwise noted)

Parameter		Symbol	Test conditions	Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage		BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	350	-	-	V
Zero gate voltage drain current		I <sub>DSS</sub>	V <sub>DS</sub> =350V, V <sub>GS</sub> =0V	-	-	1	μA
			V <sub>DS</sub> =280V, T <sub>C</sub> =125°C	-	-	10	μA
Gate-body leakage current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V	-	-	10	uA
	Reverse		V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	-	-	-10	uA
Breakdown voltage temperature coefficient		ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	I <sub>D</sub> =250μA	-	0.35	-	V/°C
On characteristics							
Gate threshold voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> I <sub>D</sub> =250μA	2.0	-	4.0	V
Static drain-source on- resistance		R <sub>DS(ON)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A	-	0.6	0.85	Ω
Forward transconductance		g <sub>FS</sub>	V <sub>DS</sub> =40V, I <sub>D</sub> =4.5A(note4)	-	7.8	-	S
Dynamic characteristics							
Input capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	-	844	-	pF
Output capacitance		C <sub>OSS</sub>		-	162	-	pF
Reverse transfer capacitance		C <sub>RSS</sub>		-	4	-	pF
Switching characteristics							
Turn-on delay time		t <sub>D(ON)</sub>	V <sub>DD</sub> =175V, I <sub>D</sub> =9.0A, R <sub>G</sub> =25Ω (note4,5)	-	25	-	ns
Rise time		t <sub>R</sub>		-	23.5	-	ns
Turn-off delay time		t <sub>D(OFF)</sub>		-	77	-	ns
Fall time		t <sub>F</sub>		-	47.5	-	ns
Total gate charge		Q <sub>G</sub>	V <sub>DS</sub> =280V, I <sub>D</sub> =9.0A V <sub>GS</sub> =10V (note4,5)	-	15	-	nC
Gate-source charge		Q <sub>GS</sub>		-	4	-	nC
Gate-drain charge		Q <sub>GD</sub>		-	5	-	nC
Drain-source diode characteristics							
drain-source diode forward voltage		V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>SD</sub> =11A	-	-	1.4	V
Continuous drain-source current		I <sub>S</sub>		-	-	11	A
Pulsed drain-source current		I <sub>SM</sub> *				36	A
Reverse recovery time		t <sub>RR</sub>	I <sub>S</sub> =9.0A		317	-	ns
Reverse recovery charge		Q <sub>RR</sub>	dI <sub>SD</sub> /dt=100A/μs (note4)		2.5	-	μC

Notes:1.repetitive rating;pulse width limited by maximum junction temperature

2.L=6.3mH, I<sub>AS</sub>=9.0A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, starting T<sub>J</sub>=25°C

3. I<sub>SD</sub>≤11A, di/dt≤100A/μs, V<sub>DD</sub>≤BV<sub>DSS</sub>, starting T<sub>J</sub>=25°C

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

5.Essentially independent of operating temperature

7. Typical characteristics

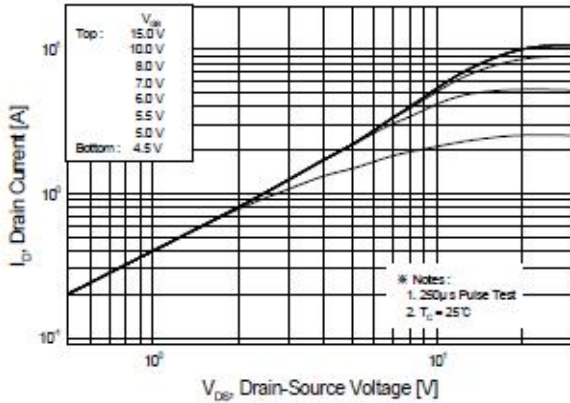


Figure 1. On-Region Characteristics

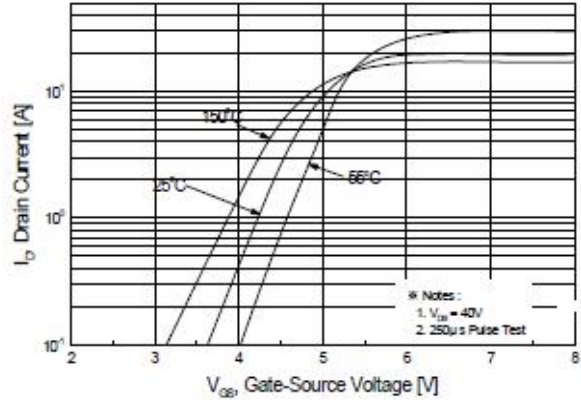


Figure 2. Transfer Characteristics

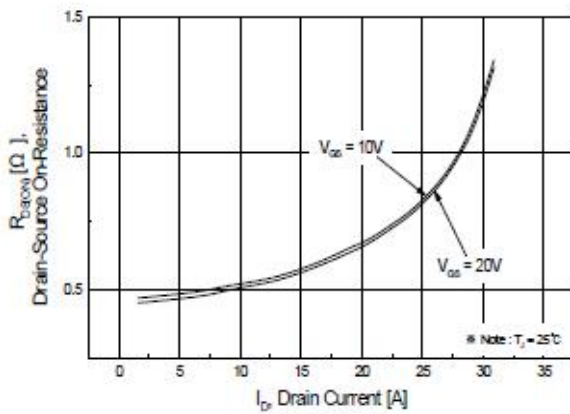


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

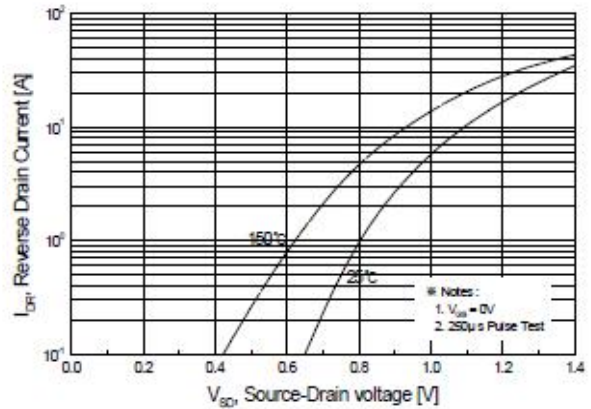


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

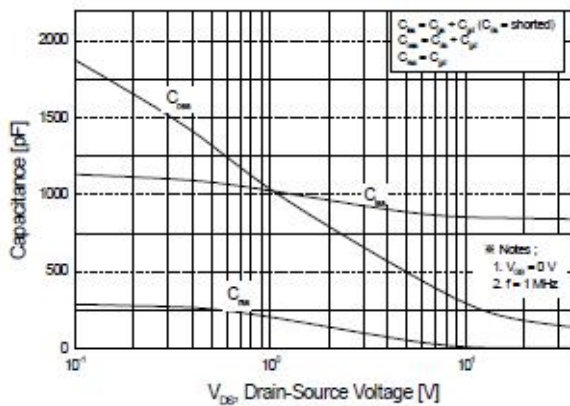


Figure 5. Capacitance Characteristics

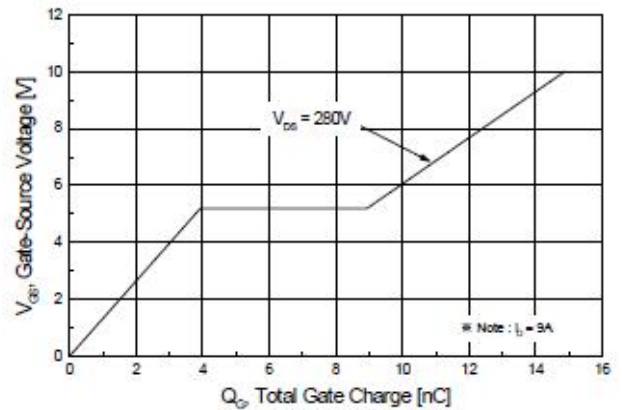
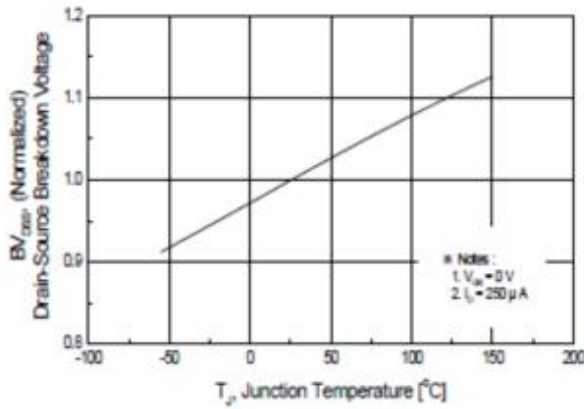
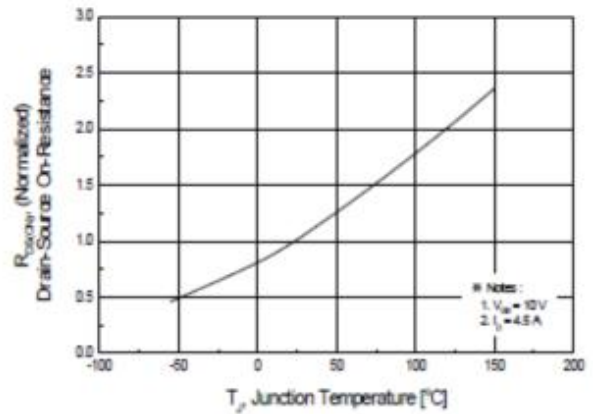


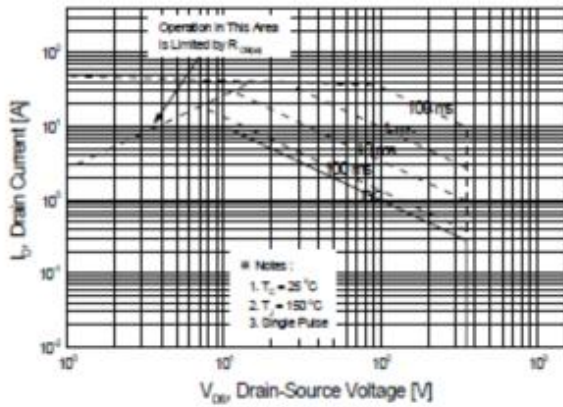
Figure 6. Gate Charge Characteristics



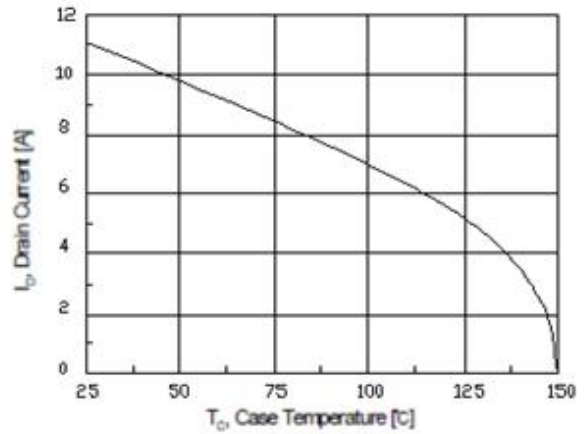
**Figure 7. Breakdown Voltage Variation vs Temperature**



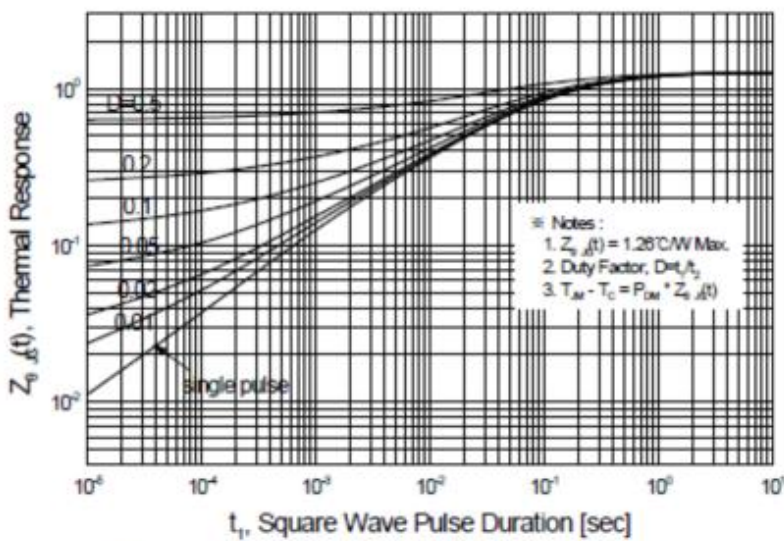
**Figure 8. On-Resistance Variation vs Temperature**



**Figure 9. Maximum Safe Operating Area**



**Figure 10. Maximum Drain Current vs Case Temperature**



**Figure 11. Transient Thermal Response Curve**