

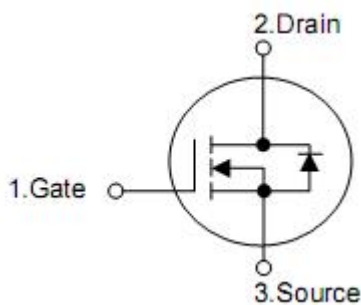
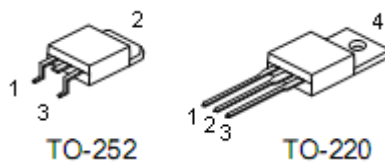
1. Description

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 $R_{DS(ON)}=0.38\Omega@V_{GS}=10V$.
- 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}	± 20		V	
Drain current continuous	I_D	$T_C = 25^\circ\text{C}$	11	11*	A
		$T_C = 100^\circ\text{C}$	6.6	6.6*	A
Drain current pulsed (note1)	I_{DM}	36		A	
Avalanche Enlised	Repetitive (note1)	E_{AR}		9.91	mJ
	Single pulse (note2)	E_{AS}		423	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	P_D	$T_C = 25^\circ\text{C}$	99		W
		Derate above 25°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_C= 25 °C, unless otherwise noted)

Parameter		Symbol	Test conditions	Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	350	-	-	V
Zero gate voltage drain current		I _{DSS}	V _{DS} =350V, V _{GS} =0V	-	-	1	μA
			V _{DS} =280V, T _C =125°C	-	-	10	μA
Gate-body leakage current	Forward	I _{GSS}	V _{GS} =20V, V _{DS} =0V	-	-	10	uA
	Reverse		V _{GS} =-20V, V _{DS} =0V	-	-	-10	uA
Breakdown voltage temperature coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA	-	0.35	-	V/°C
On characteristics							
Gate threshold voltage		V _{GS(TH)}	V _{DS} = V _{GS} I _D =250μA	2.0	-	4.0	V
Static drain-source on- resistance		R _{DS(ON)}	V _{DS} =10V, I _D =4.5A	-	0.38	0.48	Ω
Forward transconductance		g _{FS}	V _{DS} =40V, I _D =4.5A(note4)	-	7.8	-	S
Dynamic characteristics							
Input capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	844	-	pF
Output capacitance		C _{OSS}		-	162	-	pF
Reverse transfer capacitance		C _{RSS}		-	4	-	pF
Switching characteristics							
Turn-on delay time		t _{D(ON)}	V _{DD} =175V, I _D =9.0A, R _G =25Ω (note4,5)	-	25	-	ns
Rise time		t _R		-	23.5	-	ns
Turn-off delay time		t _{D(OFF)}		-	77	-	ns
Fall time		t _F		-	47.5	-	ns
Total gate charge		Q _G	V _{DS} =280V, I _D =9.0A V _{GS} =10V (note4,5)	-	15	-	nC
Gate-source charge		Q _{GS}		-	4	-	nC
Gate-drain charge		Q _{GD}		-	5	-	nC
Drain-source diode characteristics							
drain-source diode forward voltage		V _{SD}	V _{GS} =0V, I _{SD} =11A	-	-	1.4	V
Continuous drain-source current		I _S		-	-	11	A
Pulsed drain-source current		I _{SM} *				36	A
Reverse recovery time		t _{RR}	I _S =9.0A		317	-	ns
Reverse recovery charge		Q _{RR}	dI _{SD} /dt=100A/μs (note4)		2.5	-	μC

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

2.L=6.3mH, I_{AS}=9.0A, V_{DD}=50V, R_G=25Ω, starting T_J=25°C

3.I_{SD}≤11A, di/dt≤100A/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. Typical characteristics

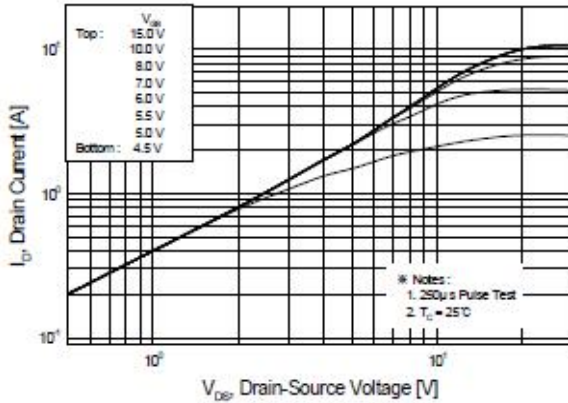


Figure 1. On-Region Characteristics

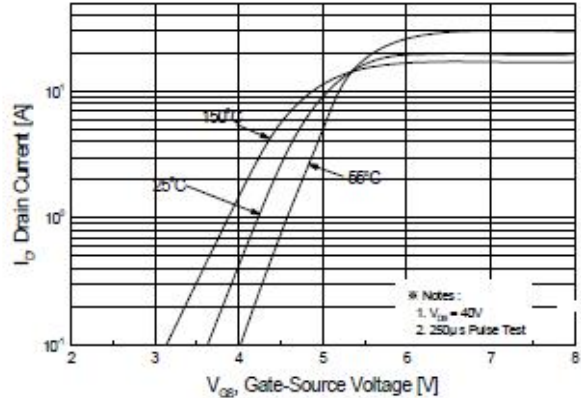


Figure 2. Transfer Characteristics

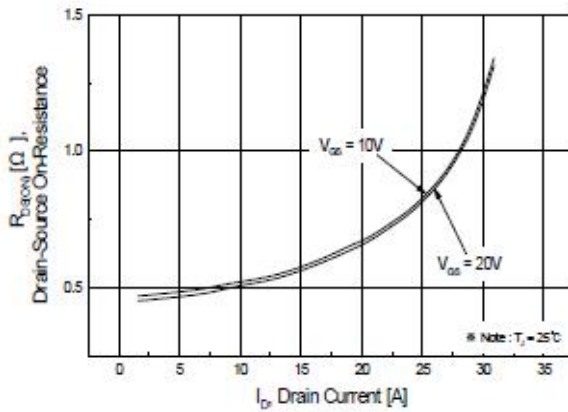


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

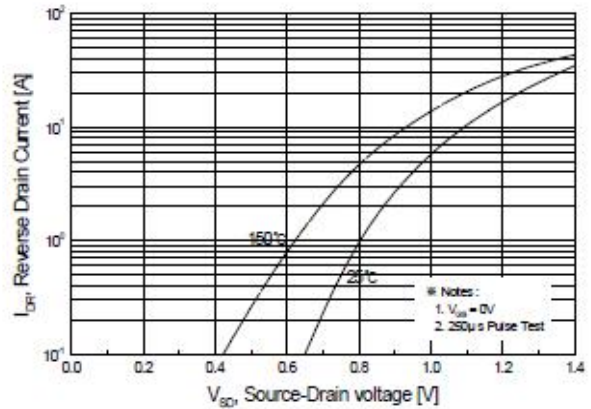


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

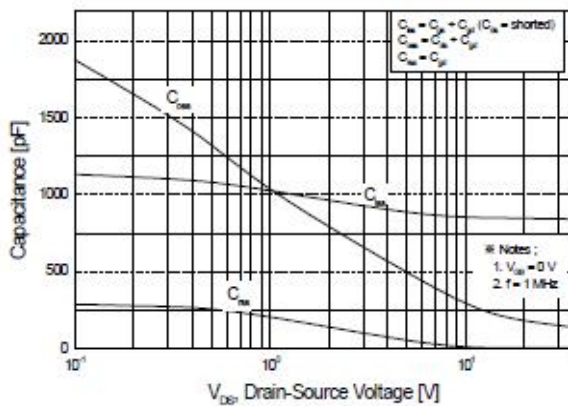


Figure 5. Capacitance Characteristics

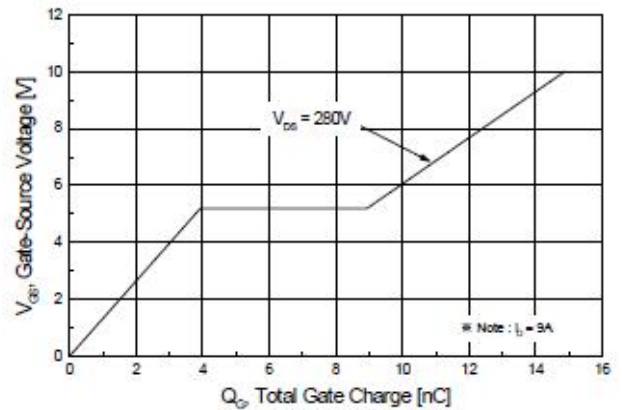


Figure 6. Gate Charge Characteristics

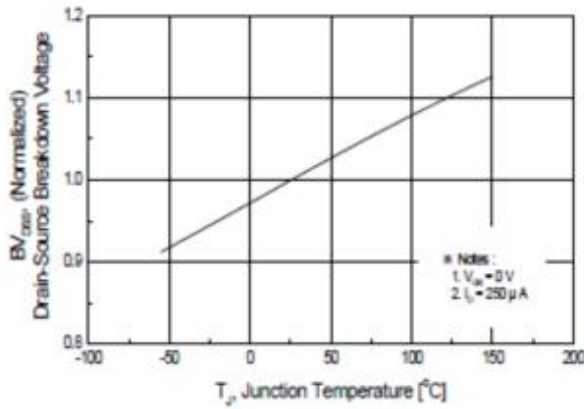


Figure 7. Breakdown Voltage Variation vs Temperature

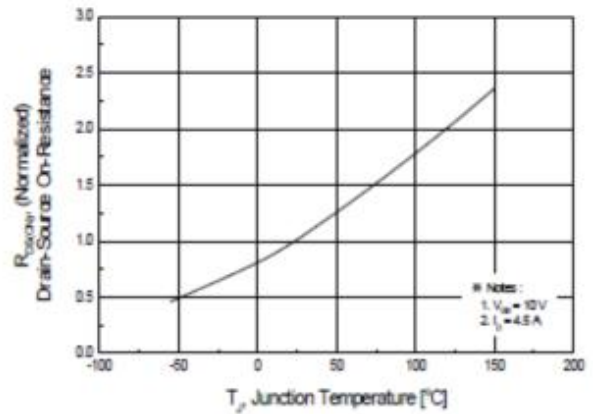


Figure 8. On-Resistance Variation vs Temperature

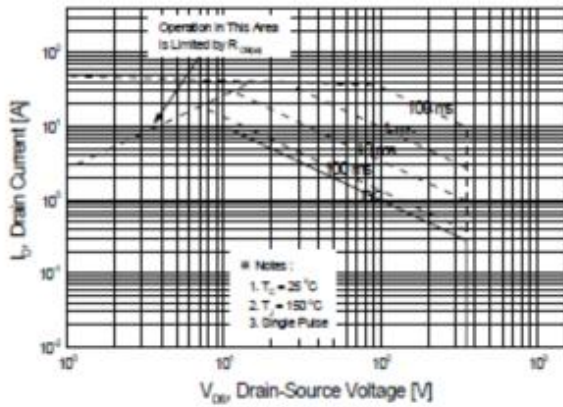


Figure 9. Maximum Safe Operating Area

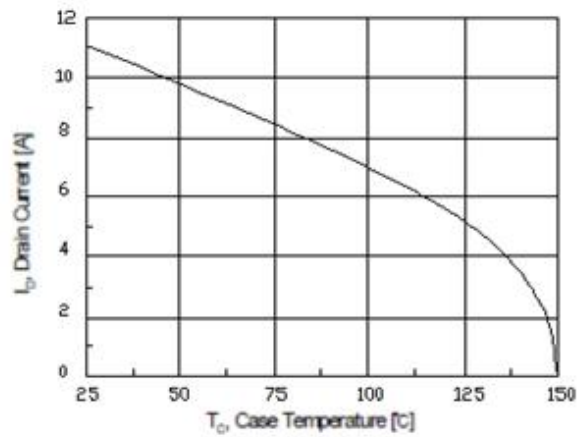


Figure 10. Maximum Drain Current vs Case Temperature

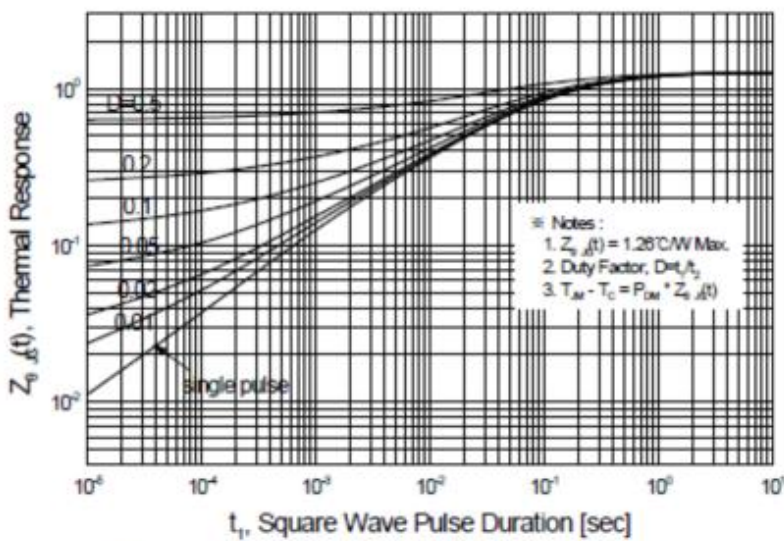


Figure 11. Transient Thermal Response Curve