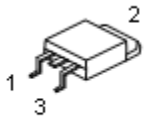
1. Description

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 effciency switched mode power supplies, active power factor correction based on half bridge topology.

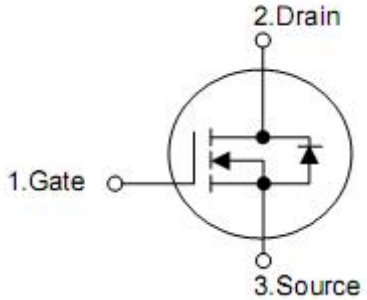
2. Features

- $R_{DS(on)}$=70m Ω @ V_{GS}=10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

3. Pin configuration



TO-252



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C= 25 ºC , unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	150	V
Gate-source voltage		V_{GSS}	±20	V
Drain current continuous	T_C=25ºC	I_D	20	A
	T_C=100ºC		14	A
Drain current pulsed		I_{DM}	40	A
Avalanche energy Single pulse (note5)		E_{AS}	200	mJ
Total power dissipation	T_C=25 ºC	P_D	75	W
	derate above 25 ºC		0.5	W/ºC
Operating and storage temperature range		T_J, T_{STG}	-55~+175	ºC

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-case (note 2)	R_{thJC}	2.0	ºC/W

6. Electrical characteristics

(T_C=25°C,unless otherwise noted)

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	150	165	-	V
Zero gate voltage drain current		I_{DSS}	V_{DS}=150V ,V_{GS}=0V	-	-	1	μA
Gate-body leakage current	Forward	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
	Reverse		V_{GS}=-20V,V_{DS}=0V	-	-	-100	nA
On characteristics							
Gate threshold voltage		$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.6	2.5	V
Static drain-source on-resistance		$R_{DS(on)}$	V_{GS}=10V,I_D=10A	-	70	85	mΩ
Forward transconductance		g_{FS}	V_{DS}=5V,I_D=10A	-	20	-	S
Dynamic characteristics							
Input capacitance		C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	2500	-	pF
Output capacitance		C_{oss}		-	326	-	pF
Reverse transfer capacitance		C_{rss}		-	202	-	pF
Switching characteristics							
Turn-on delay time		$t_{d(on)}$	V_{DD}=75V,R_L=5Ω , V_{GS}=10V,R_{GEN}=3Ω	-	10.5	-	ns
Rise time		t_r		-	5.5	-	ns
Turn-off delay time		$t_{d(off)}$		-	14.5	-	ns
Fall time		t_f		-	3	-	ns
Total gate charge		Q_g	V_{DS}=75V,I_D=10A , V_{GS}=10V	-	18	-	nC
Gate-source charge		Q_{gs}		-	4.1	-	nC
Gate-drain charge		Q_{gd}		-	4.5	-	nC
Drain-source diode characteristics and maximum ratings							
Drain-source diode forward voltage(note 3)		V_{SD}	V_{GS}=0V,I_{SD}=20A	-	-	1.2	V
Continuous drain-source current (note 2)		I_{SD}		-	-	20	A
Reverse recovery time		t_{rr}	T_J=25℃， I_F=10A dI$_F$/dt=100A/μs (note4)	-	32	-	ns
Reverse recovery charge		Q_{rr}		-	53	-	μC

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

2. Surface mounted on FR4 board, t ≤10sec.

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

4. Guaranteed by design, not subject to production

5. EAS condition : T_J=25℃， V_{DD}=50V， V_G=10V， L=0.5mH， R_g=25Ω.

7. Test circuits and waveforms

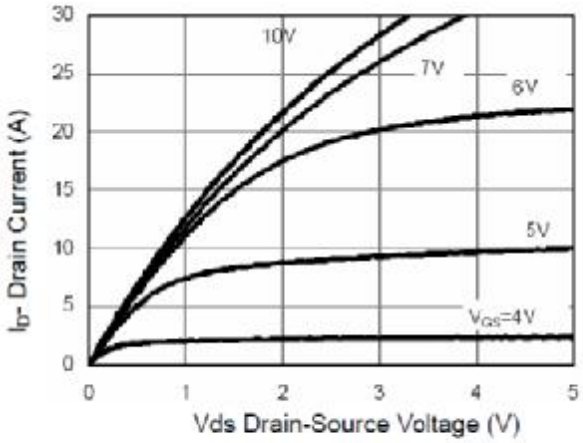


Figure 1 Output Characteristics

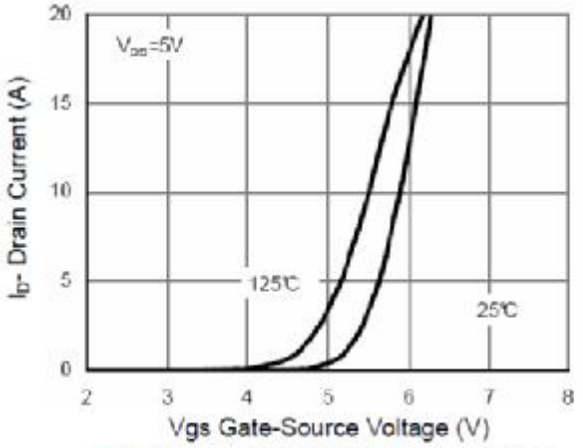


Figure 2 Transfer Characteristics

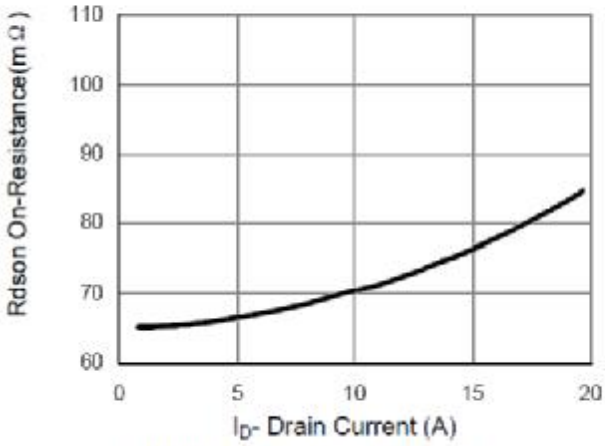


Figure 3 Rdson- Drain Current

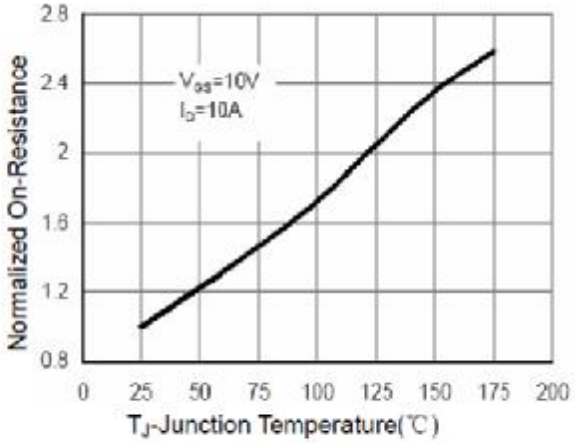


Figure 4 Rdson-JunctionTemperature

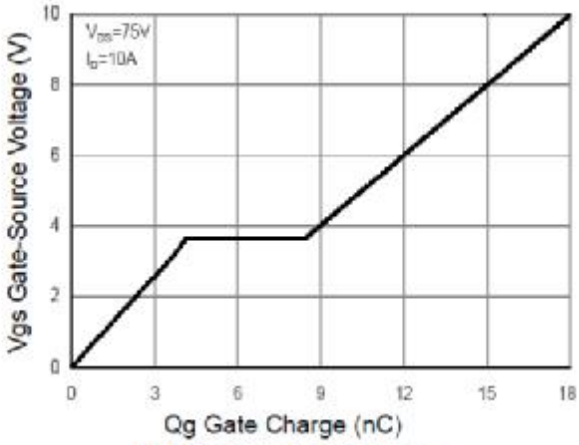


Figure 5 Gate Charge

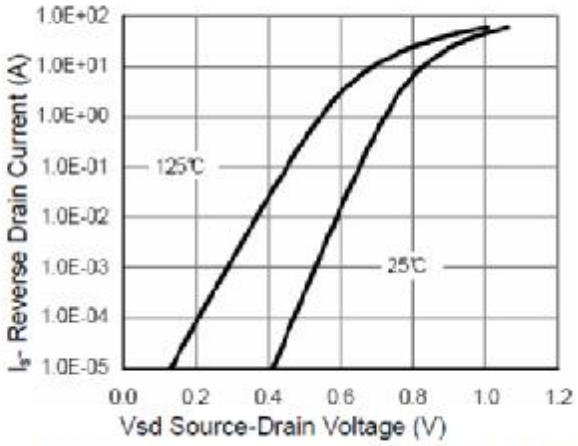


Figure 6 Source- Drain Diode Forward

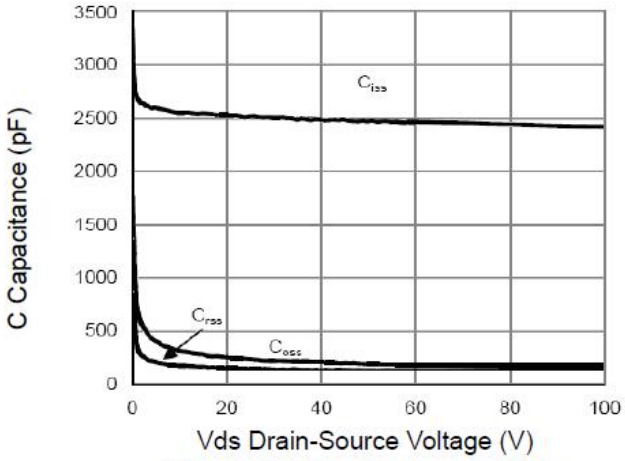


Figure 7 Capacitance vs Vds

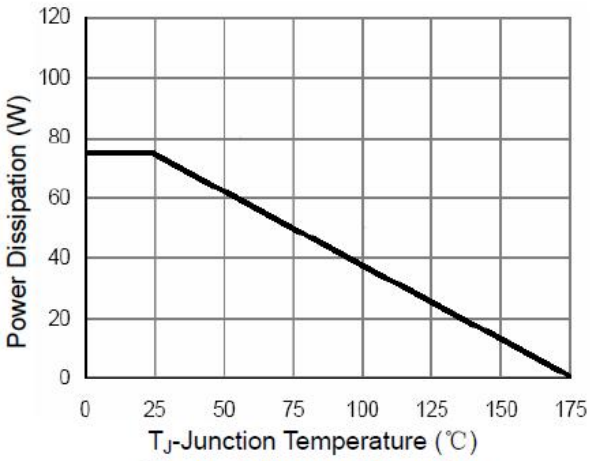


Figure 9 Power De-rating

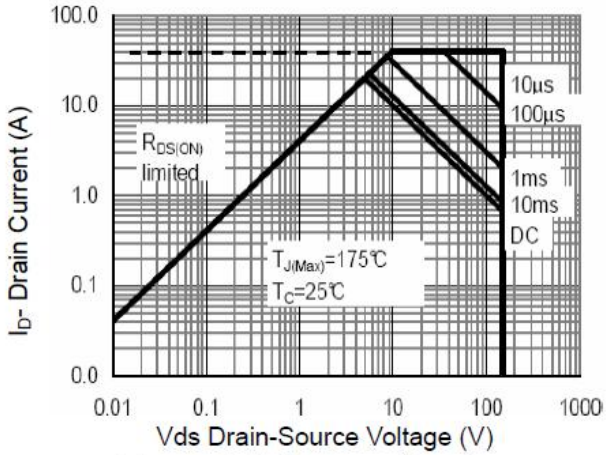


Figure 8 Safe Operation Area

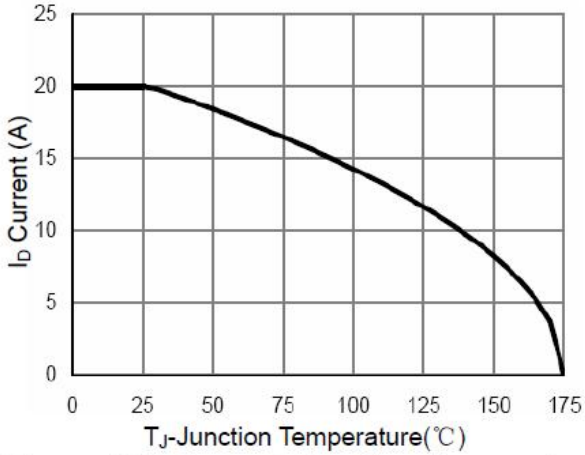


Figure 10ID Current- Junction Temperature

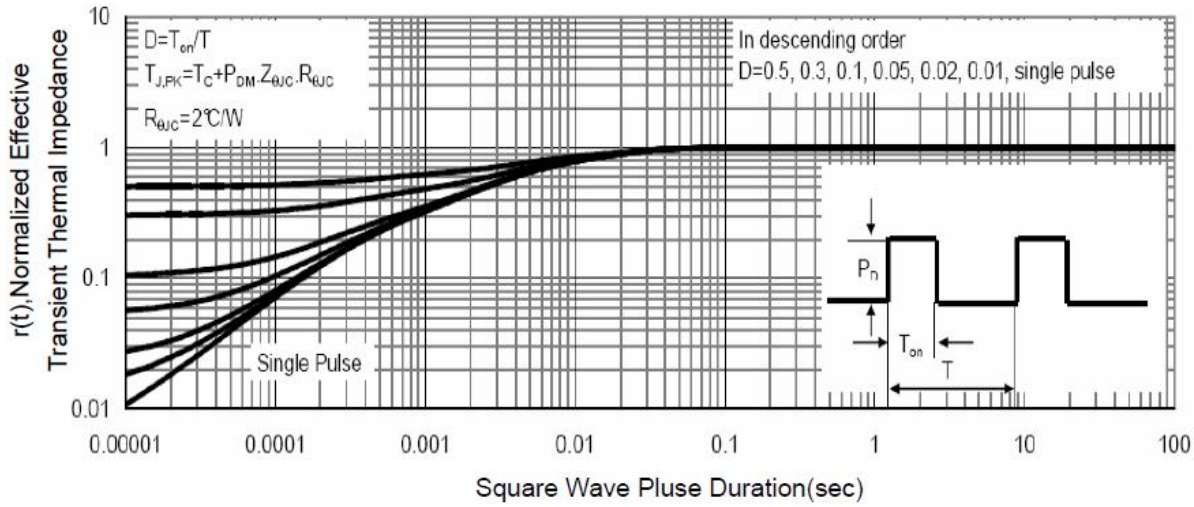


Figure 11 Normalized Maximum Transient Thermal Impedance