

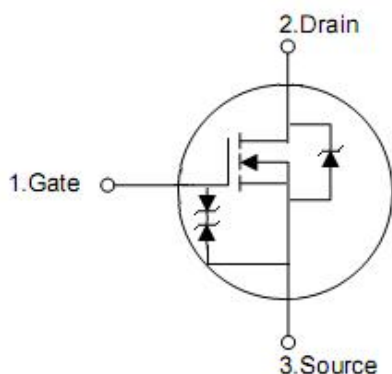
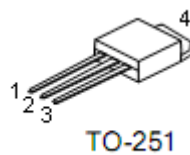
1. Description

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 $R_{DS(on) typ} = 1.35\Omega @ V_{GS} = 10V$
- n Low gate charge (typical 23.5nC)
- n High ruggedness
- n Fast switching
- n 100% avalanche tested
- 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°C , unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-source voltage	V _{DSS}	700	V
Drain current continuous	I _D	T _C =25°C	5.8
		T _C =100°C	3.0
Drain current pulsed (note1)	I _{DM}	24	A
Gate-source voltage	V _{GSS}	±30	V
Single Pulse avalanche energy	E _{AS}	185	mJ
Peak diode recovery dv/dt	dv/dt	5	V/ns
Gate-source ESD(HBM-C=100pF,R=1.5K Ω)	VESD _(G-S)	3000	V
Power dissipation	P _D	T _C =25°C	100
		Derate above 25°C	0.8
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

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance junction-case	R _{thJC}	1.25	°C/W
Thermal resistance junction-ambient	R _{thJA}	62	

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	700	-	-	V	
Gate Source Breakdown Voltage	V _{gso}	I _{GS} = ±1mA (Open Drain)	±30				
Breakdow voltage temperature coefficient	ΔBV _{DSS} ΔT _J	I _D =250μA, Referenced to 25°C	-	0.7	-	V/°C	
Zero gate voltage drain current	I _{DSS}	V _{DS} =700V, V _{GS} =0V	-	-	1	μA	
		V _{DS} =560V, T _C =125°C	-	-	100	μA	
Gate-body leakage current	Forward	I _{GSS}	V _{GS} =20V, V _{DS} =0V	-	-	10	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V	-	-	-10	μA
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 _{GS} =10V, I _D =3.0A	-	1.35	1.6	Ω	
Forward transconductance	g _{fs}	V _{DS} =15V, I _D =3.0A	-	5.0	-	S	
Dynamic characteristics							
Input capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	938	-	pF	
Output capacitance	C _{OSS}		-	87.8	-	pF	
Reverse transfer capacitance	C _{RSS}		-	8.2	-	pF	
Switching characteristics							
Turn-on delay time	t _{D(ON)}	V _{DD} =350V, R _G =25Ω, V _{GS} =10V, I _D =6.0A	-	14.7	-	ns	
Rise time	t _R		-	26	-	ns	
Turn-off delay time	t _{D(OFF)}		-	68.4	-	ns	
Fall time	t _F		-	34.6	-	ns	
Total gate charge	Q _G	V _{DS} =350V, V _{GS} =10V, I _D =6.0A	-	23.5	-	nC	
Gate-source charge	Q _{GS}		-	4.5	-	nC	
Gate-drain charge	Q _{GD}		-	9.2	-	nC	
Drain-source diode characteristics							
Continuous drain-source current	I _S		-	-	6	A	
Pulsed drain-source current	I _{SM}		-	-	24	A	
Drain-source diode forward voltage	V _{SD}	V _{GS} =0V, I _S =6A	-	-	1.5	V	
Reverse recovery time	t _{RR}	V _{GS} =0V, I _S =6.0A, di _F /dt=100A/μs	-	195	-	ns	
Reverse recovery charge	Q _{RR}		-	887	-	nC	

[1] T_J=+25°C to +150°C

[2] Pulse width ≤ 380 μs; duty cycle ≤ 2%.

7. Test circuits and waveforms

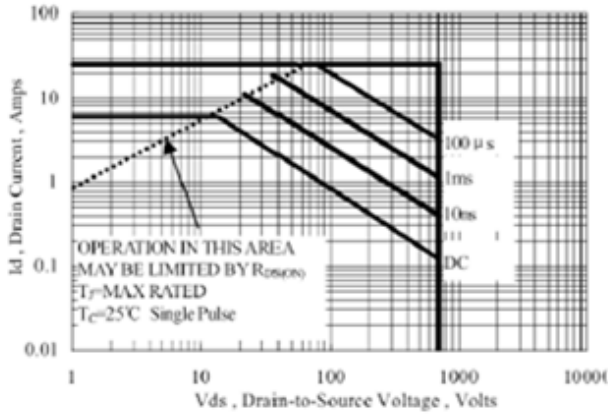


Figure 1 Maximum Forward Bias Safe Operating Area

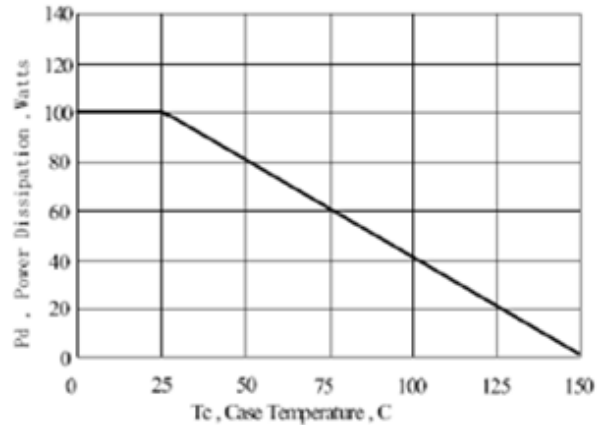


Figure 2 Maximum Power Dissipation vs Case Temperature

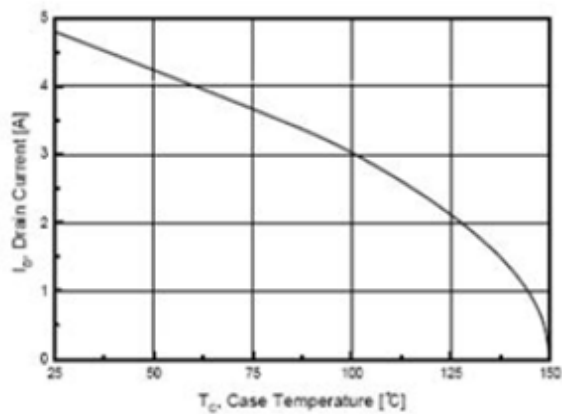


Figure 3 Maximum Continuous Drain Current vs Case Temperature

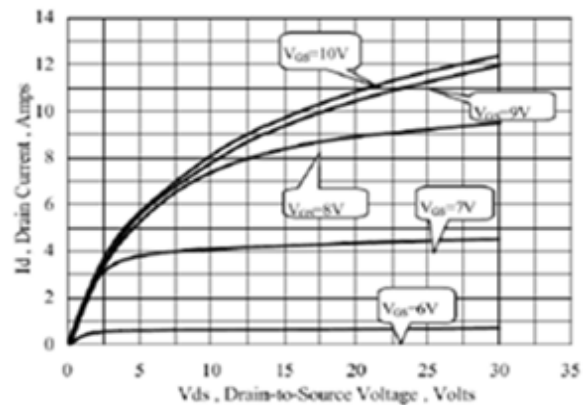


Figure 4 Typical Output Characteristics

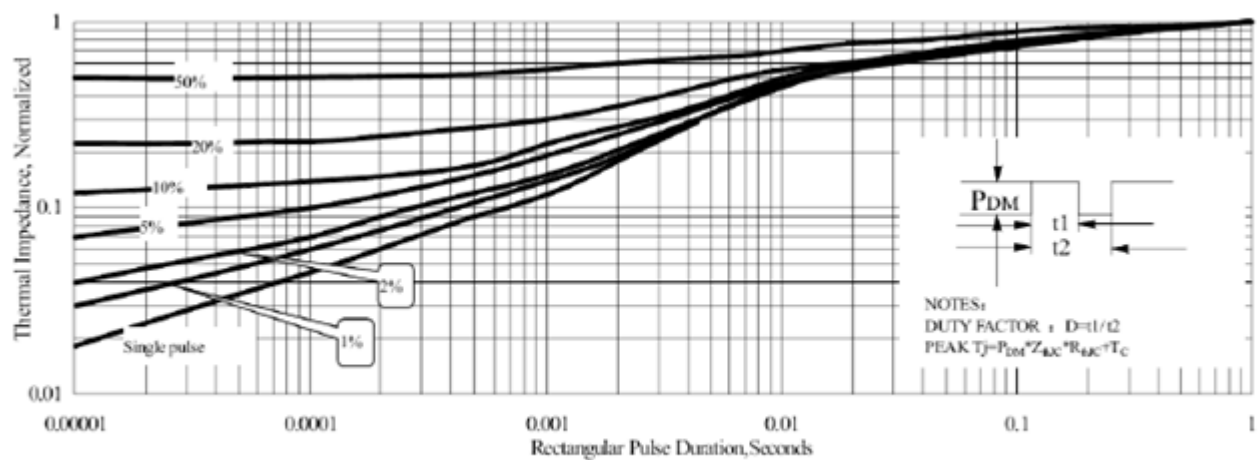


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

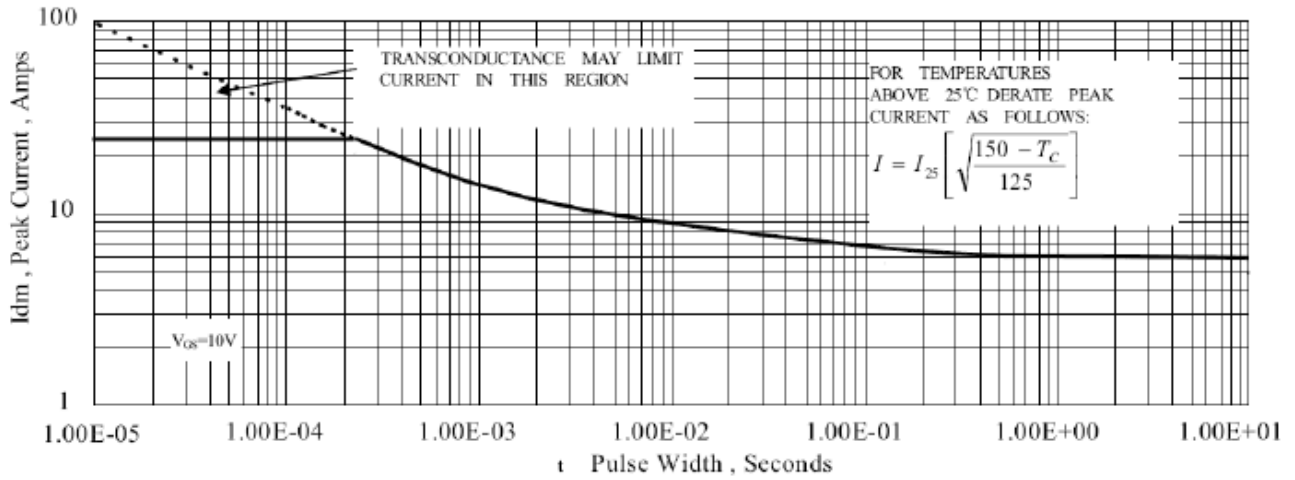


Figure 6 Maximum Peak Current Capability

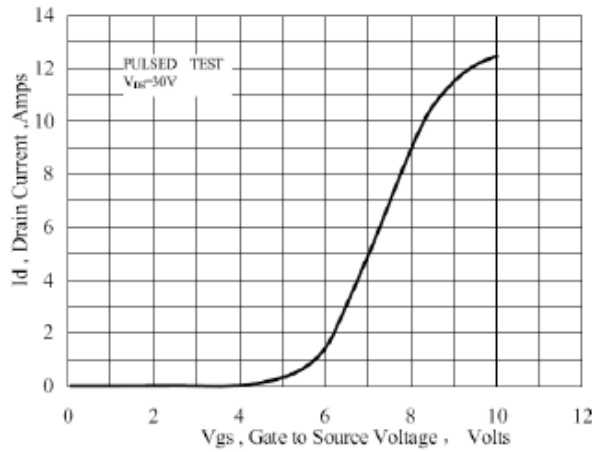


Figure 7 Typical Transfer Characteristics

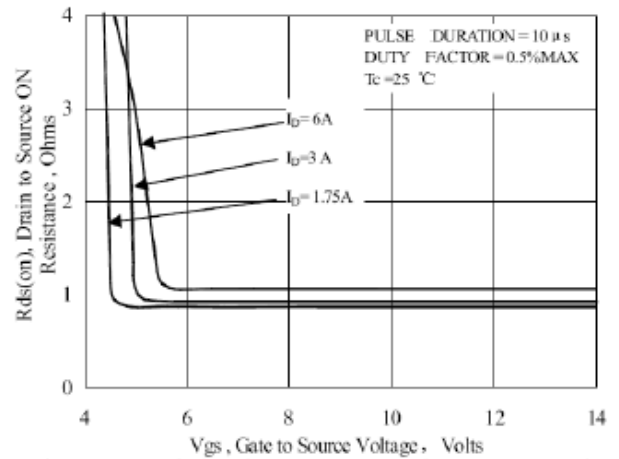


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage

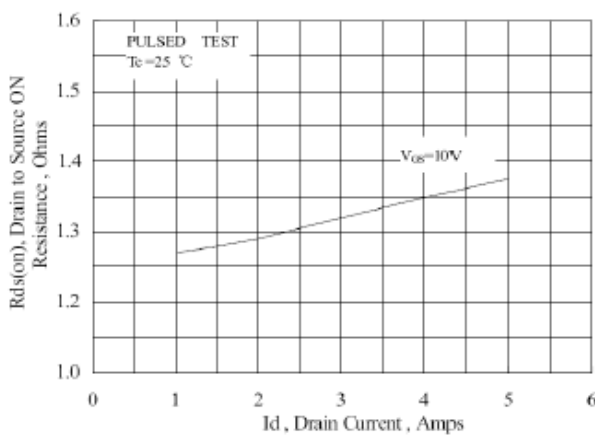


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

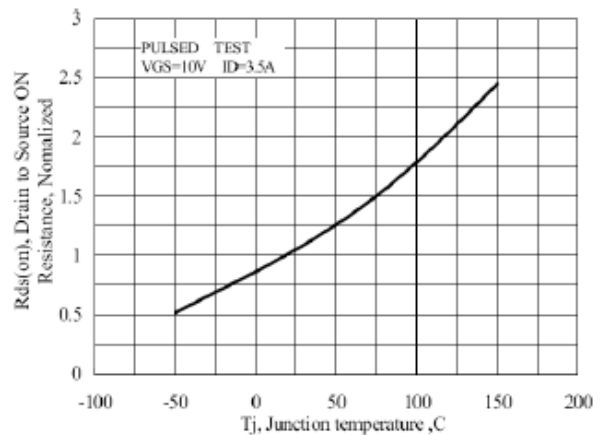


Figure 10 Typical Drain to Source on Resistance vs Junction Temperature

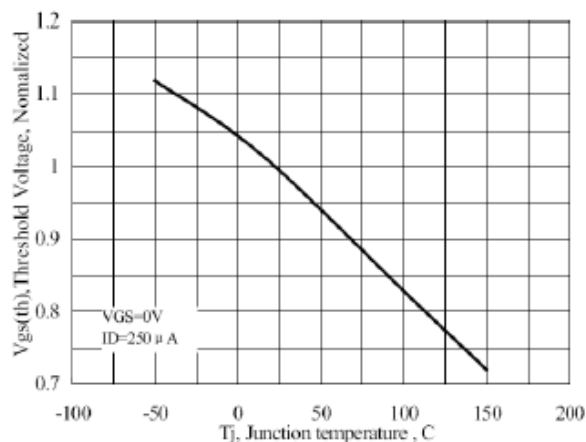


Figure 11 Typical Theshold Voltage vs Junction Temperature

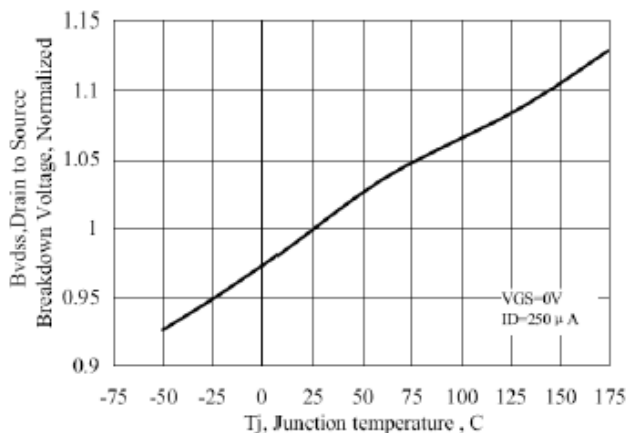


Figure 12 Typical Breakdown Voltage vs Junction Temperature

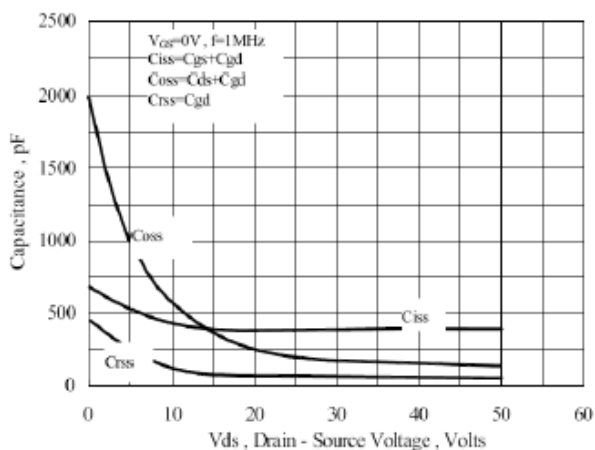


Figure 13 Typical Capacitance vs Drain to Source Voltage

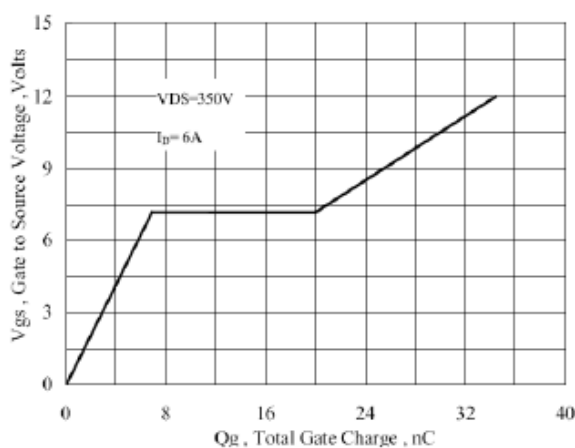


Figure 14 Typical Gate Charge vs Gate to Source Voltage

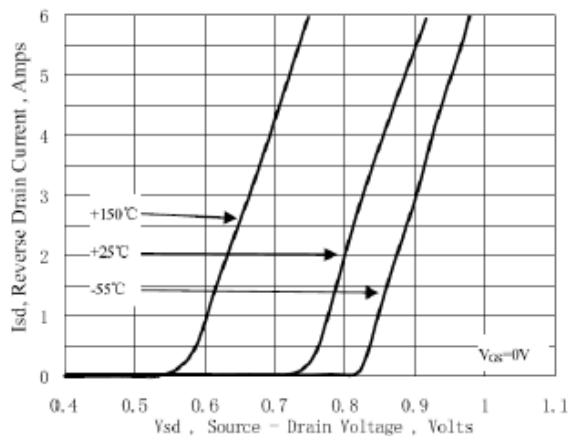


Figure 15 Typical Body Diode Transfer Characteristics

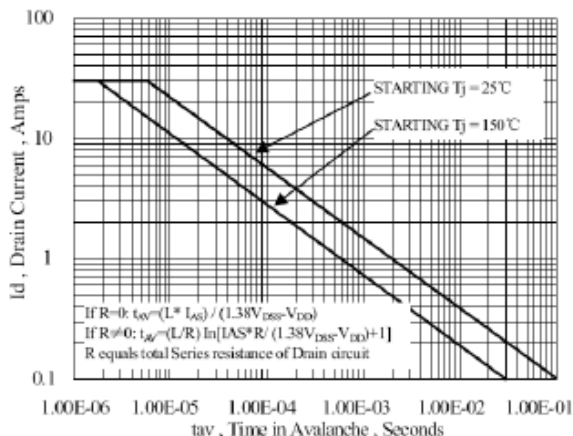


Figure 16 Unclamped Inductive Switching Capability