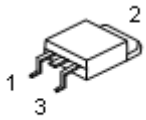
1. Features

- $R_{DS(on)}$=78mΩ(typ) @ V_{GS}=10V
- 100% EAS guaranteed
- Green device available
- Super low gate charge
- Excellent Cdv/dt effect decline
- Advanced high cell density trench technology

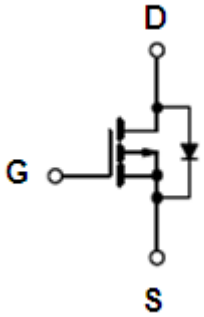
2.Description

The KIA23P10A uses advanced trench MOSFET technology to provide excellent $R_{DS(ON)}$ and gate charge for use in a wide variety of other applications. The KIA23P10A meet the RoHS and Green product requirememt, 100% EAS guaranteed with full function reliability approved.

3.Symbol



TO-252



4.Absolute maximum ratings

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DS}	-100	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current V_{GS}@-10V[1]	T_C=25°C	I_D	-23	A
	T_C=100°C		-16	
Pulsed drain current[2]		I_{DM}	-75	A
Single pulse avalanche energy[3]		EAS	157.2	mJ
Avalanche current		I_{AS}	18.9	A
Total power dissipation[4]	T_A=25°C	P_D	96	W
Junction and storage temperature range		T_J,T_{STG}	-55 to150	°C
Thermal resistance-junction to ambient[1]		$R_{\theta JA}$	62	°C/W
Thermal resistance-junction to case[1]		$R_{\theta JC}$	1.3	°C/W

5.Electrical characteristics

(T_J=25°C,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-100V,V_{GS}=0V, T_J=25°C	-	-	-50	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	-1.2	-1.7	-2.5	V
Static drain-source on- resistance[2]	$R_{DS(on)}$	V_{GS}=-10V,I_D=-10A	-	78	95	mΩ
		V_{GS}=-4.5V,I_D=-8A	-	86	110	
Forward transcend ductance	g_{FS}	V_{DS}=-10V, I_D=-10A	-	24	-	S
Total gate charge	Q_g	V_{DS}=-50V, V_{GS}=-10V I_D =-20A	-	44.5	-	nC
Gate-source charge	Q_{gs}		-	9.13	-	
Gate-drain charge	Q_{gd}		-	5.93	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-50V, R_G=3.3Ω, V_{GS}=-10V I_D=-10A	-	12	-	ns
Rise time	t_r		-	27.4	-	
Turn-off delay time	$t_{d(off)}$		-	79	-	
Fall time	t_f		-	53.6	-	
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-20V F=1.0MHZ	-	3029	-	pF
Output capacitance	C_{oss}		-	129	-	
Reverse transfer capacitance	C_{rss}		-	76	-	
Diode characteristics						
Continuous source current[1.5]	I_S	V_G=V_D=0V,Force current	-	-	-23	A
Diode forward voltage[2]	V_{SD}	V_{GS}=0V,I_S=-1A, T_J=25°C	-	-	1.2	V
Reverse recovery time	t_{rr}	I_F=-8A,dI/dt=100A/us, T_J=25°C	-	38.7	-	nS
Reverse recovery charge	Q_{rr}		-	22.4	-	nC

Note:1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2. The data tested by pulsed, pulse width ≤300us,duty cycle ≤2%.

3. The EAS data shows Max.rating. The test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.88mH.I_{AS}=-18.9A.

4. The power dissipation is limited by 150 ºC junction temperature.

5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

6. Test circuits and waveforms

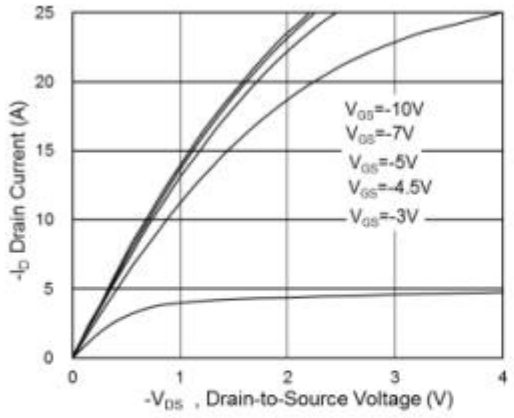


Fig.1 Typical Output Characteristics

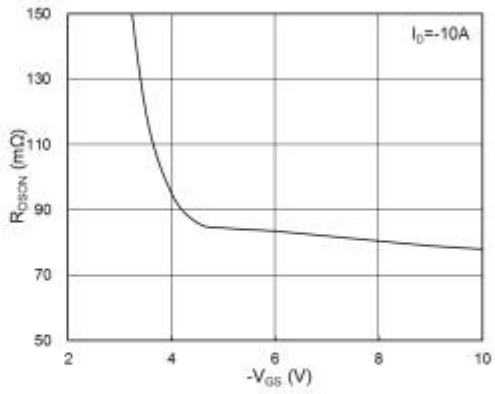


Fig.2 On-Resistance vs. G-S Voltage

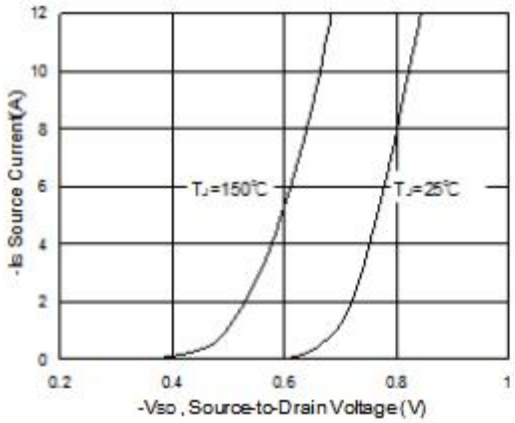


Fig.3 Typical S-D Diode Forward Voltage

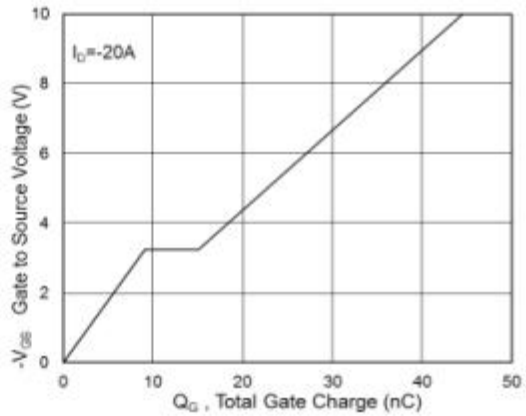


Fig.4 Gate-Charge Characteristics

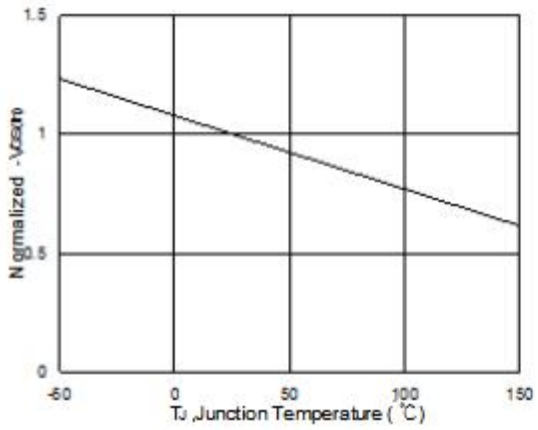


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

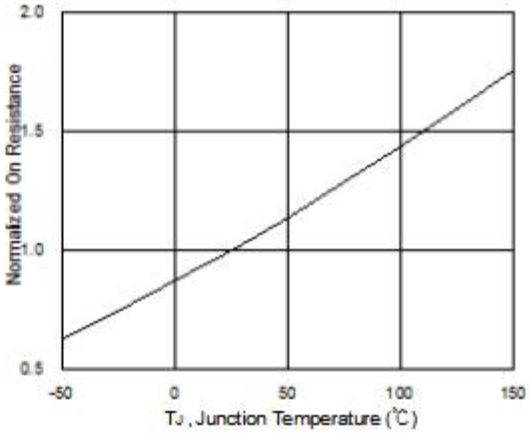


Fig.6 Normalized R_{DSON} vs. T_J

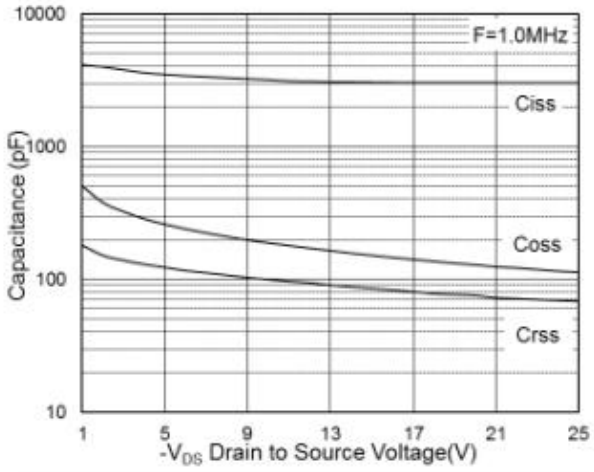


Fig.7 Capacitance

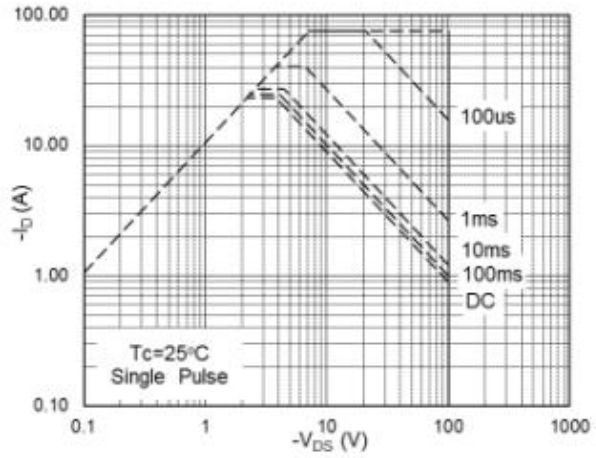


Fig.8 Safe Operating Area

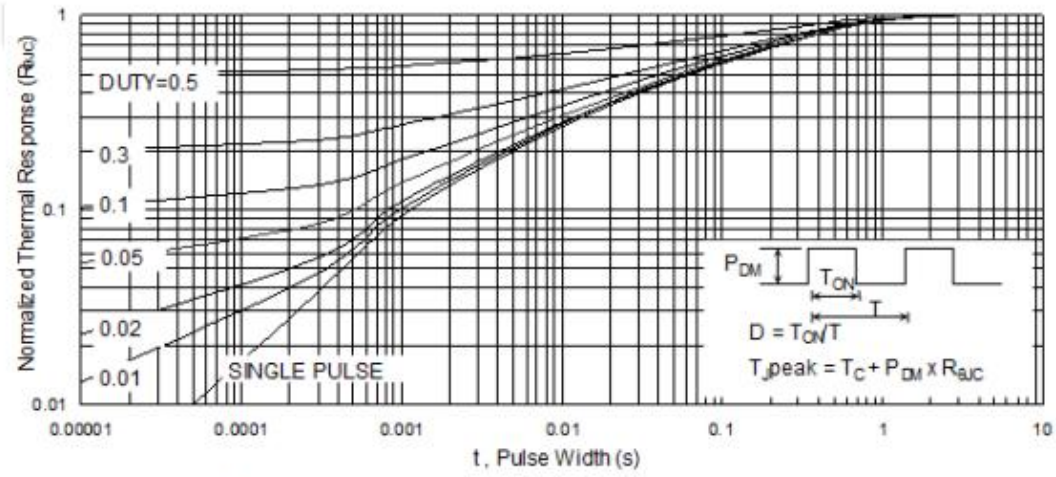


Fig.9 Normalized Maximum Transient Thermal Impedance

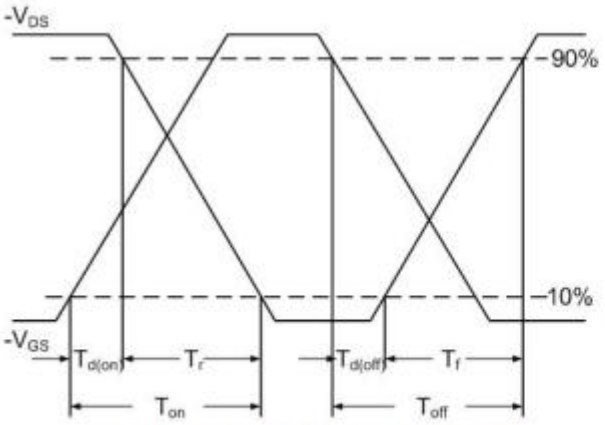


Fig.10 Switching Time Waveform

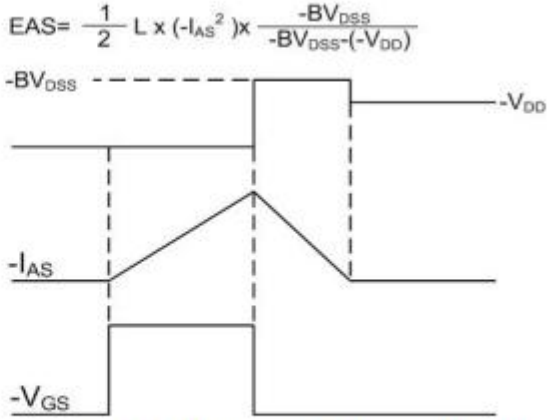


Fig.11 Unclamped Inductive Waveform