1. Description

- Advanced Trench MOS Technology
- Reliable an Rugged
- Green Device Available

2. Features

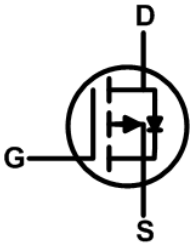
- $R_{DS(ON)}$=170mΩ (typ.) @ V_{GS}=-10V
- $R_{DS(ON)}$=190mΩ (typ.) @ V_{GS}=-4.5V

3. Applications

- Power Management
- DC Motor Control

4. Pin configuration

SOT-89



Pin	Function
1	Gate
2	Drain
3	Source

5. Ordering Information

Part Number	Package	Brand
KPS6110B	SOT89	KIA

6. Absolute maximum ratings

T_C=25°C unless otherwise specified

Parameter		Symbol	Ratings	Unit
Drain-to-Source Voltage		V_{DS}	-100	V
Gate-to-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1]	T_C=25°C	I_D	-12	A
	T_C=100°C	I_D	-8.4	A
Pulsed Drain Current [2]		I_{DM}	-48	A
Avalanche Energy [3]		EAS	49	mJ
Avalanche Current		I_{AS}	-14	A
Total Power Dissipation [4]		P_D	39	W
Operation Junction Temperature Range		T_J	-55 to 150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C

7. Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	-	55	°C/W
Thermal Resistance, Junction-to-Case [1]	$R_{\theta JC}$	-	3.2	°C/W

8. Electrical characteristics

(TJ=25°C,unless otherwise notes)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-100	-	-	V
Static Drain-Source On-Resistance 2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-5A	-	170	210	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	190	240	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.2	-	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-80V,V_{GS}=0V,T_J=25°C	-	-	1	uA
		V_{DS}=-80V,V_{GS}=0V,T_J=85°C	-	-	30	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V,f=1MHz	-	13	-	Ω
TotalGate Charge	Q_g	V_{DS}=-50V, V_{GS}=-10V , I_D=-5A	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	3.4	-	nC
Gate-Drain Charge	Q_{gd}		-	2.9	-	nC
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-30V,V_{GS}=-10V, R_G=3.3Ω,I_D=-1A	-	9	-	ns
Rise Time	T_r		-	6	-	ns
Turn-Off DelayTime	$T_{d(off)}$		-	39	-	ns
Fall Time	T_f		-	33	-	ns
Input Capacitance	C_{iss}	V_{DS}=-30V , V_{GS}=0V , f=1MHz	-	1228	-	pF
Output Capacitance	C_{oss}		-	41	-	pF
Reverse Transfer Capacitance	C_{rss}		-	29	-	pF
Continuous Source Current 1),5)	I_S	V_G=V_D=0V, Force Current	-	-	-5	A
Diode Forward Voltage 2)	V_{SD}	V_{GS}=0V, I_S=-1A , T_J=25°C	-	-	-1.2	V

Notes:
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=0.5mH, I_{AS}=-14A
4) The power dissipation is limited by 150°C 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.

9. Typical Characteristics

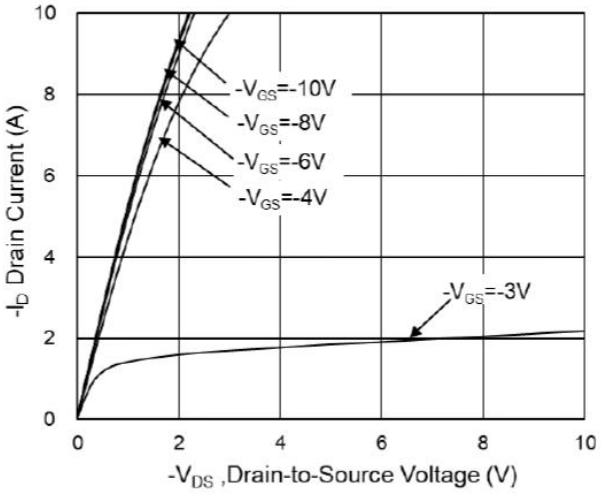


Fig.1 Typical Output Characteristics

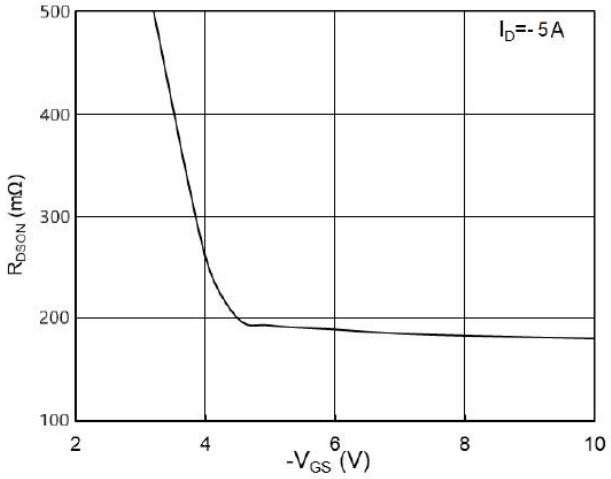


Fig.2 On-Resistance vs G-S Voltage

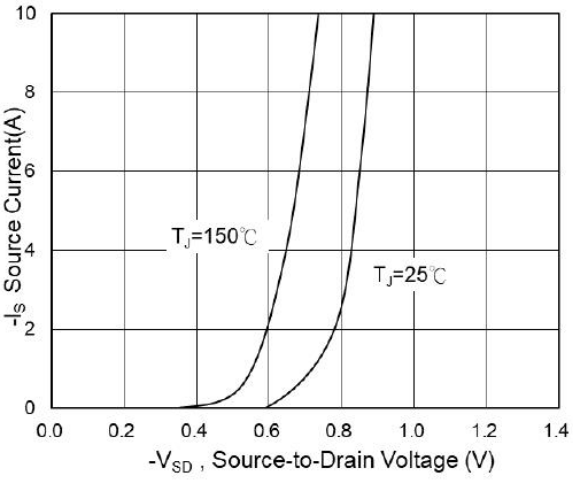


Fig.3 Source Drain Forward Characteristics

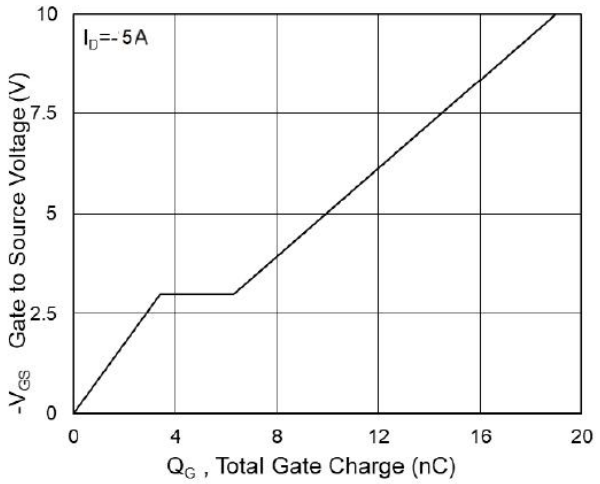


Fig.4 Gate-Charge Characteristics

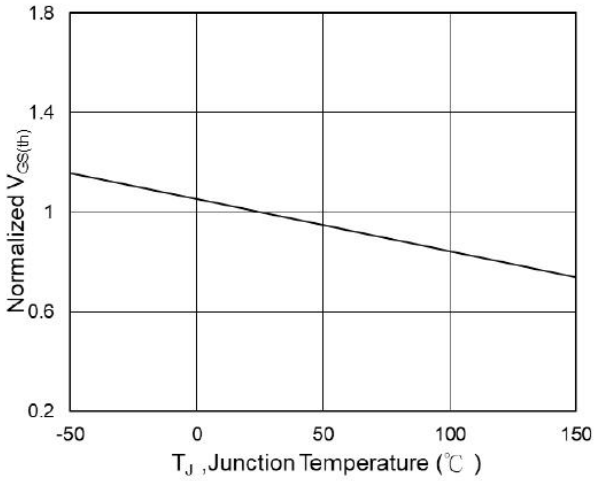


Fig.5 Normalized $V_{GS(th)}$ vs T_J

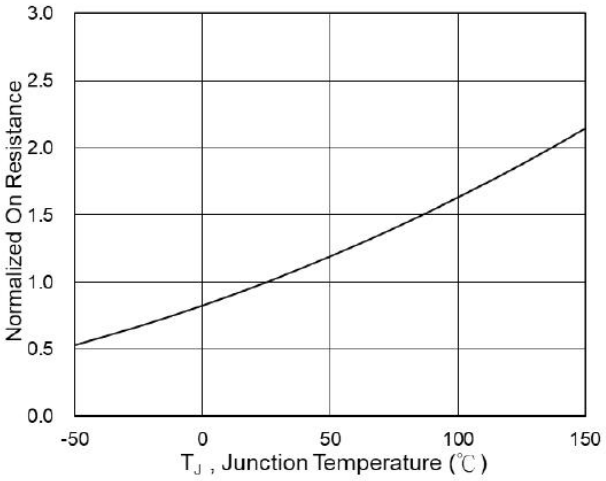


Fig.6 Normalized R_{DSON} vs T_J

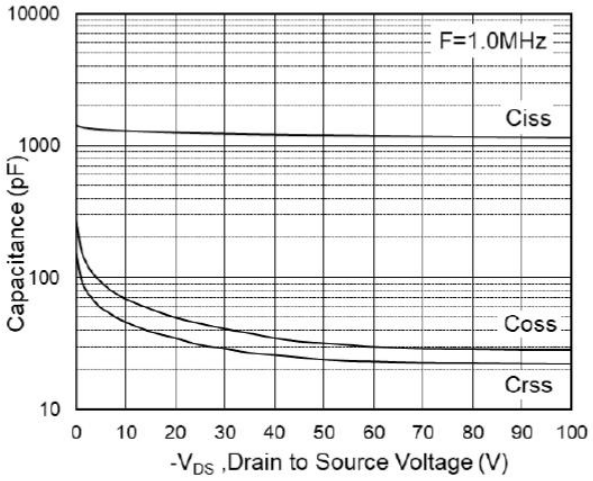


Fig.7 Capacitance

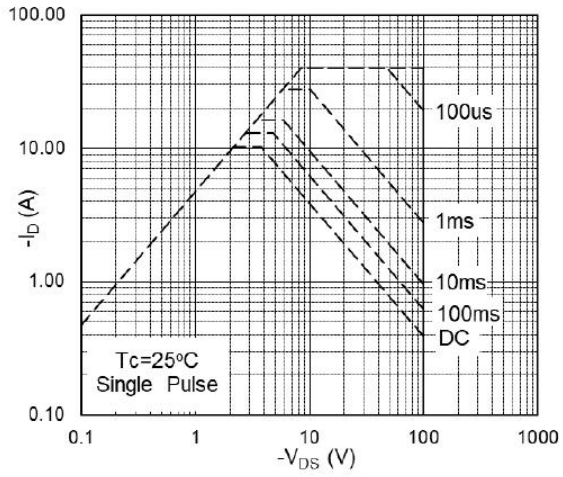


Fig.8 Safe Operating Area

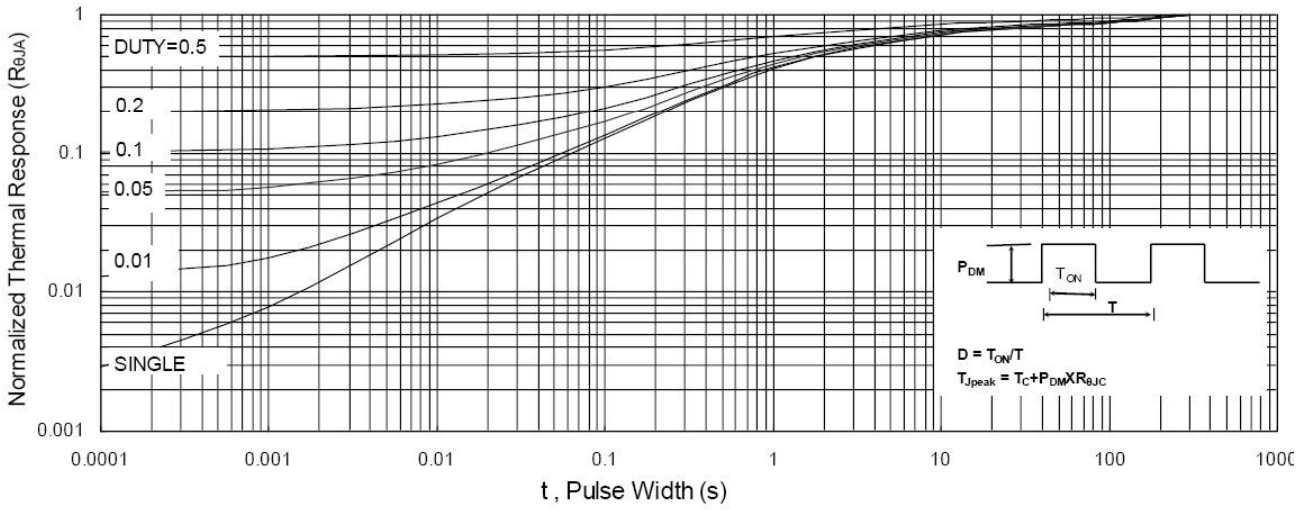


Fig.9 Normalized Maximum Transient Thermal Impedance

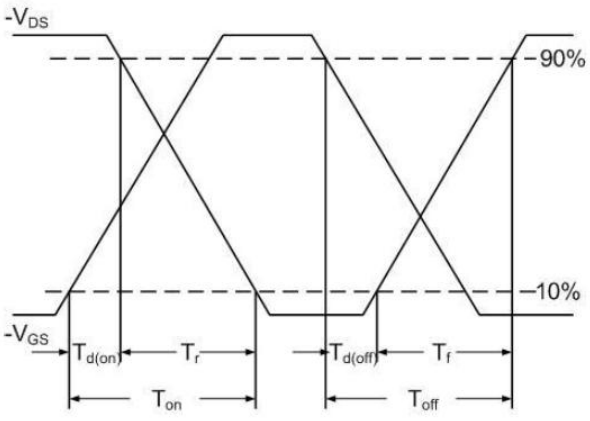


Fig.10 Switching Time Waveform

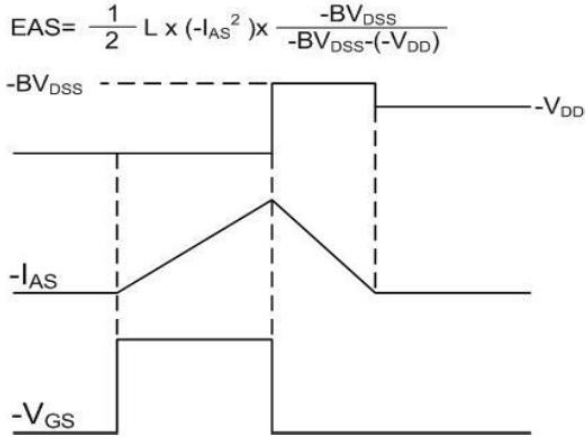


Fig.11 Unclamped Inductive Waveform