

1. Description

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

2. Features

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

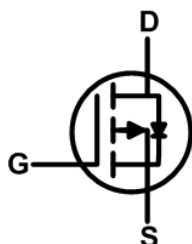
3. Applications

- 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

$T_C=25^{\circ}\text{C}$ 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⁾	$T_C=25^{\circ}\text{C}$ I_D	-12	A
	$T_C=100^{\circ}\text{C}$ 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	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$

7. Thermal characteristics

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

8. Electrical characteristics

(T_J=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
Total Gate 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 Delay Time	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 inch² FR-4 board with 20Z 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

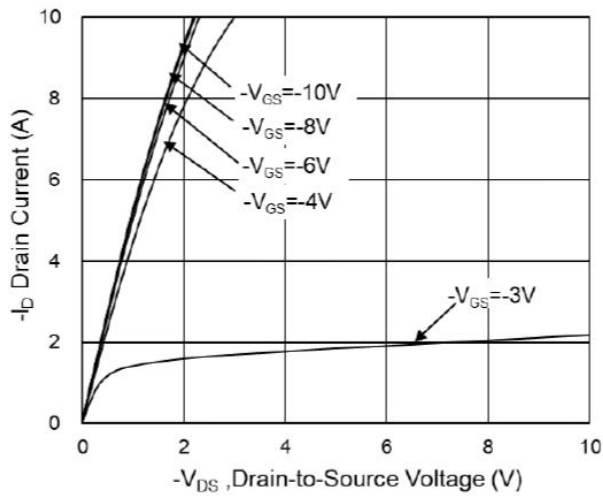


Fig.1 Typical Output Characteristics

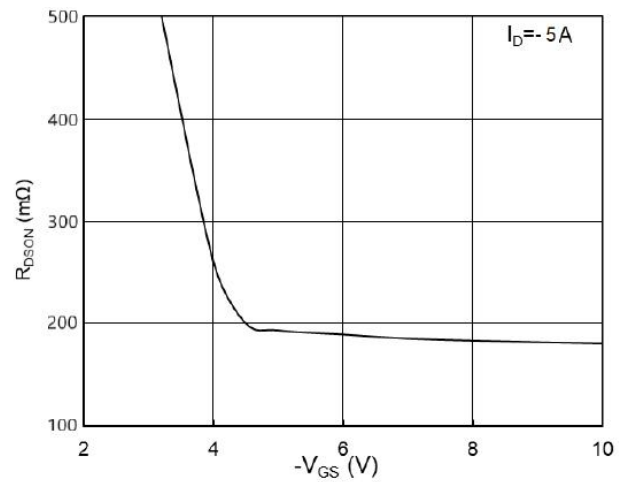


Fig.2 On-Resistance vs G-S Voltage

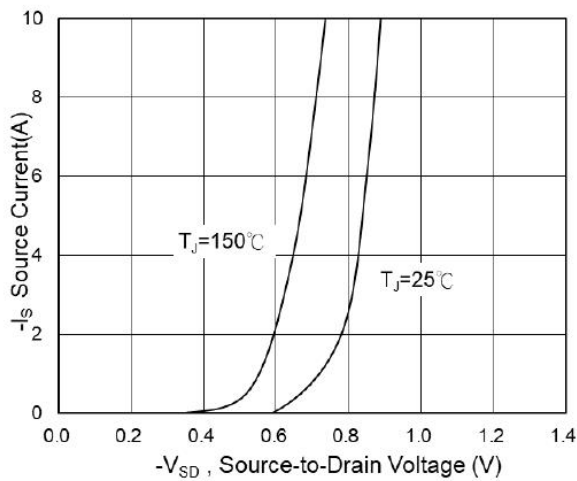


Fig.3 Source Drain Forward Characteristics

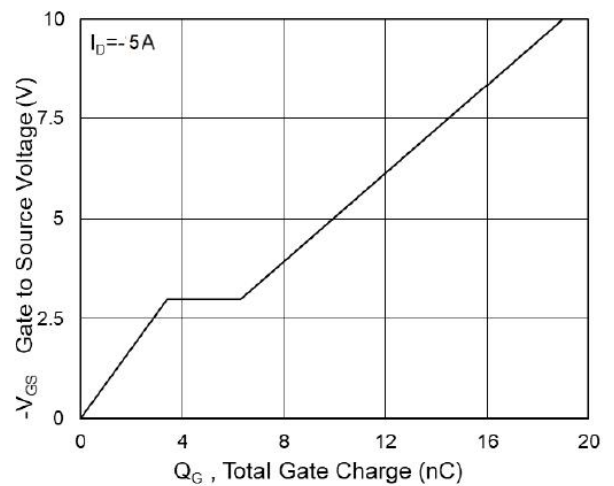


Fig.4 Gate-Charge Characteristics

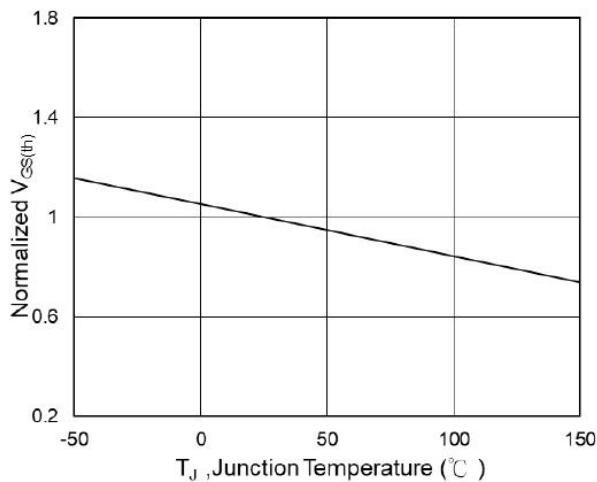


Fig.5 Normalized $V_{GS(th)}$ vs T_J

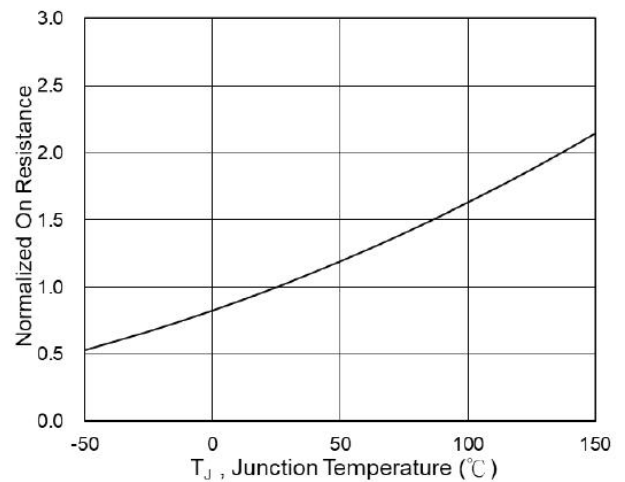


Fig.6 Normalized $R_{DS(on)}$ vs T_J

