1. Description

KCX3010A the N-channel Enhanced Power MOSFETS, is obtained by advanced double trench technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. This is suitable device for motor drivers and high speed switching applications.

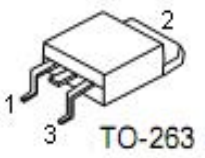
2. Features

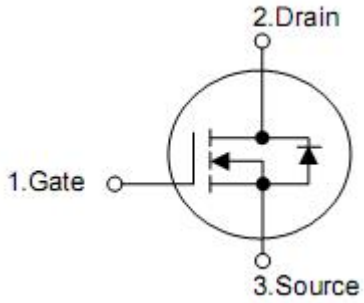
- Fast Switching
- Low On-Resistance (typ.) $R_{DS(on)}$=4.0mΩ
- Low Gate Charge
- Uses advanced SGT technology
- Low Reverse transfer capacitances
- High avalanche ruggedness

3. Applications

- Switching applications
- Motor drivers

4.Symbol





Pin	Function
1	Gate
2	Drain
3	Source

5. Ordering Information

Part Number	Package	Brand
KCB3010A	TO-263	KIA

6. Absolute maximum ratings

Parameter	Symbol	Rating	Units
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current,Silicon Limited	I_D	163	A
Continuous drain current,Package Limited		120	A
Continuous drain current @T_C=100 ºC,Silicon Limited		103	A
Pulsed drain current (Note1)	I_{DM}	480	A
Single pulse avalanche energy(Note2)	E_{AS}	756.25	mJ
power dissipation	P_D	175	W
Derating Factor above 25ºC		1.4	W/ºC
Operation junction and temperature range	T_J, T_{STG}	150,-55 to150	ºC
Maximum Temperature for Soldering	T_L	260	ºC

7. Thermal characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.71	ºC /W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	

7. Electrical characteristics

(T_A=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 on-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=30A	-	4.0	4.5	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.0	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		V_{DS}=80V, V_{GS}=0V @T_C=125 ºC	-	-	100	μA
Gate-Soure Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V	-	-	100	nA
Gate-Soure Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V	-	-	-100	nA
Total gate charge	Q_g	V_{DD}=50V, V_{GS}=10V I_D =100A	-	89.5	-	nC
Gate-source charge	Q_{gs}		-	44.3	-	
Gate-drain charge	Q_{gd}		-	13.2	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=55A, R_{GEN}=4.7Ω, V_{GS}=10V, Resistive Load	-	32	-	ns
Rise time	t_r		-	55	-	
Turn-off delay time	$t_{d(off)}$		-	68.5	-	
Fall time	t_f		-	31	-	
Input capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V, f=1MHz	-	6700	-	pF
Output capacitance	C_{oss}		-	880	-	
Reverse transfer capacitance	C_{rss}		-	145	-	
Continuous Source Current	I_S		-	-	120	A
Maximum Pulsed Current	I_{SM}		-	-	480	A
Diode Forward voltage	V_{SD}	V_{GS}=0V,I_S=55A	-	-	1.2	V
Body diode reverse recovery time	t_{rr}	Is=55A,V_{DD}=80V, T_J=150ºC dI/dt=100A/us	-	75	-	ns
Body diode reverse recovery charge	Q_{rr}		-	220	-	nC

Note
1：Repetitive Rating：Pulse width limited by maximum junction temperature
2：L=0.5mH, Ias=55A, Start T_J =25ºC.

8. Test circuits

Figure 1. Safe Operating Area

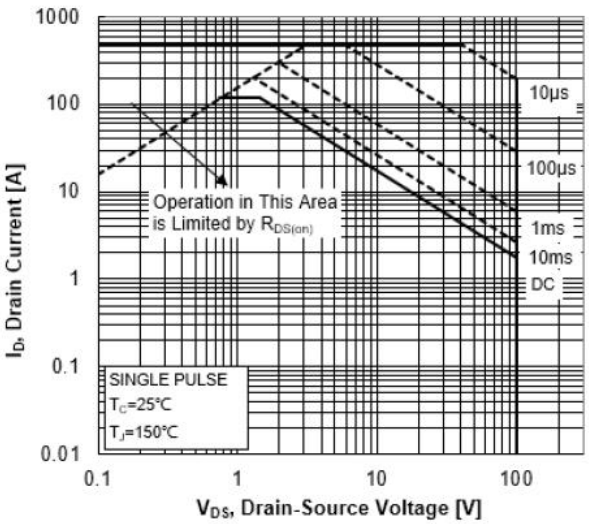


Figure 2. Maximum Power Dissipation vs Case Temperature

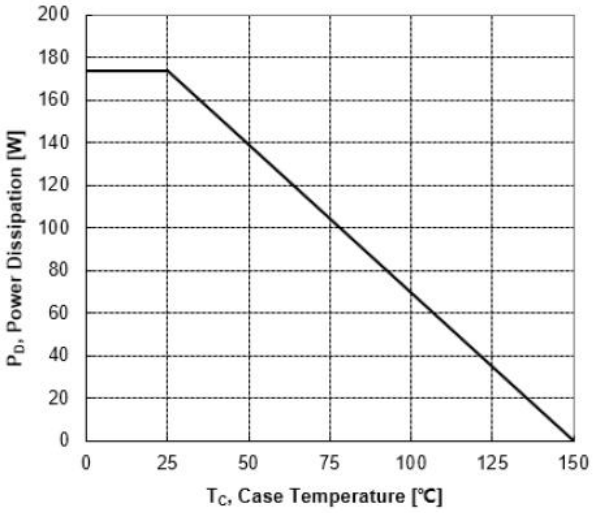


Figure 3. Maximum Continuous Drain Current vs Case Temperature

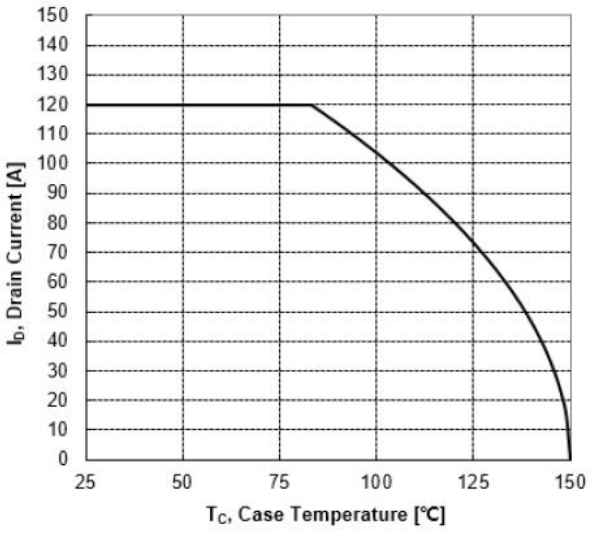


Figure 4. Typical Output Characteristics

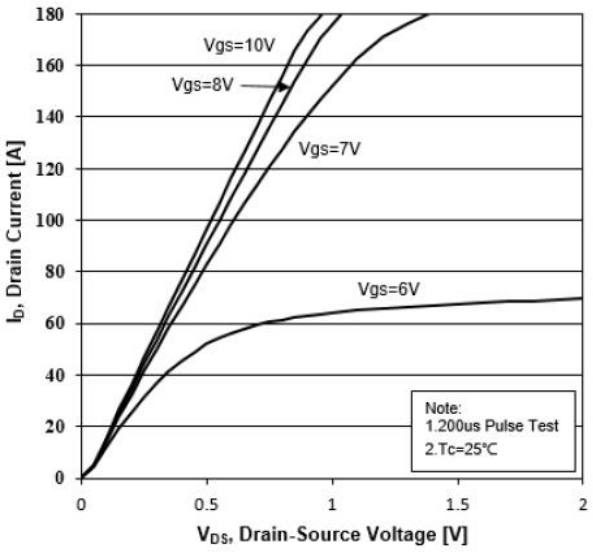


Figure 5. Transient Thermal Impedance

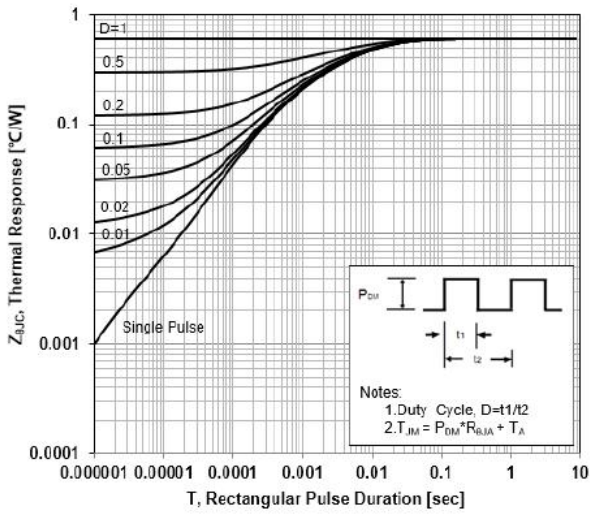


Figure 6. Typical Transfer Characteristics

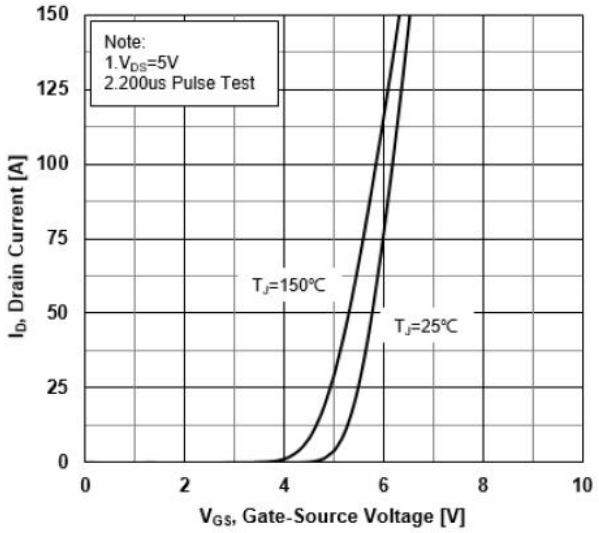


Figure 7. Source-Drain Diode Forward Characteristics

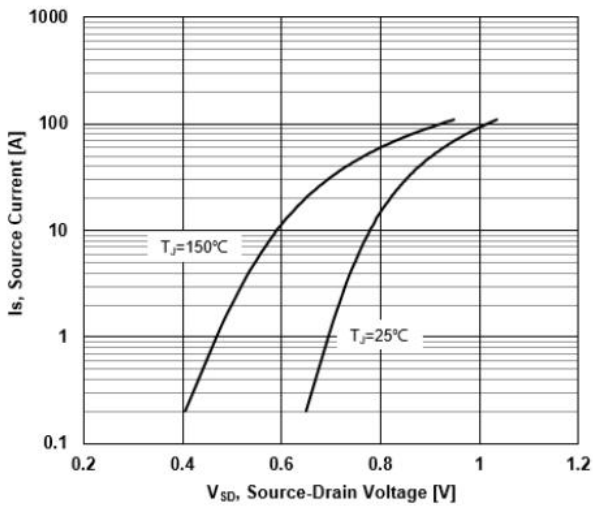


Figure 8. Drain-Source On-Resistance vs Drain Current

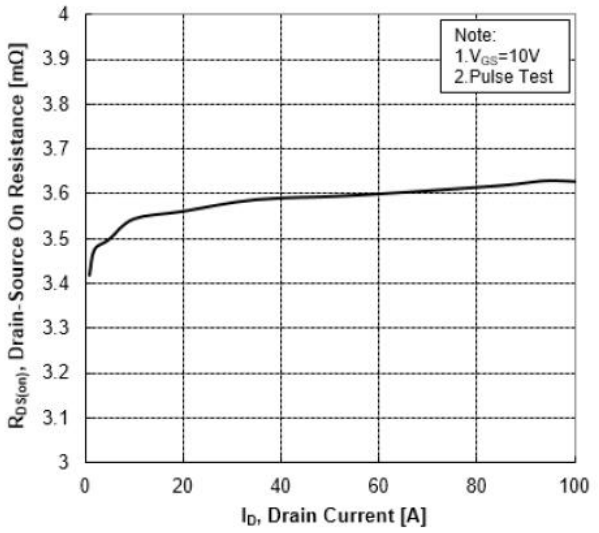


Figure 9. Normalized On-Resistance vs Junction Temperature

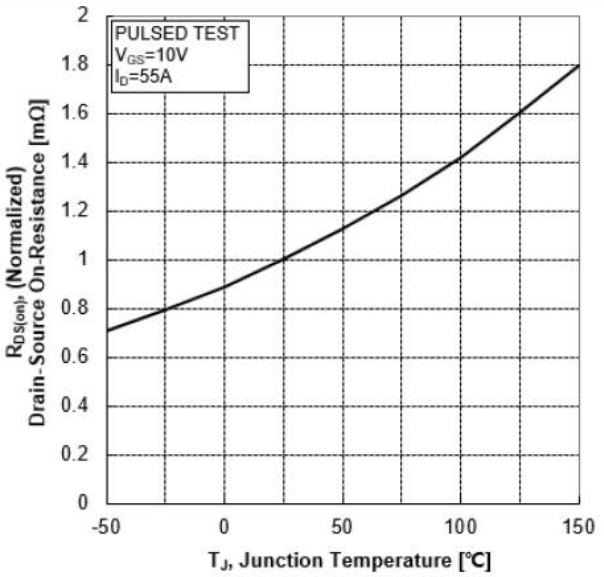


Figure 10. Normalized Threshold Voltage vs Junction Temperature

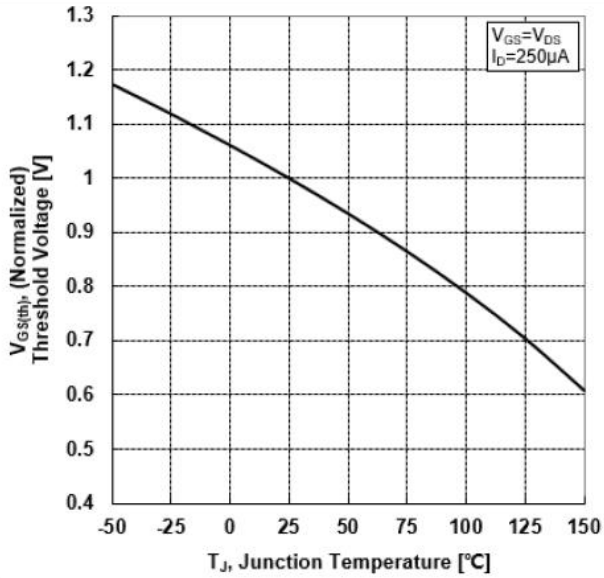


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

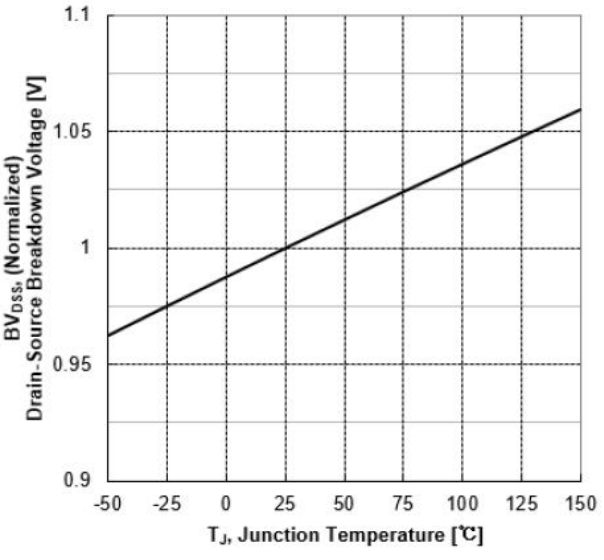


Figure 12. Capacitance Characteristics

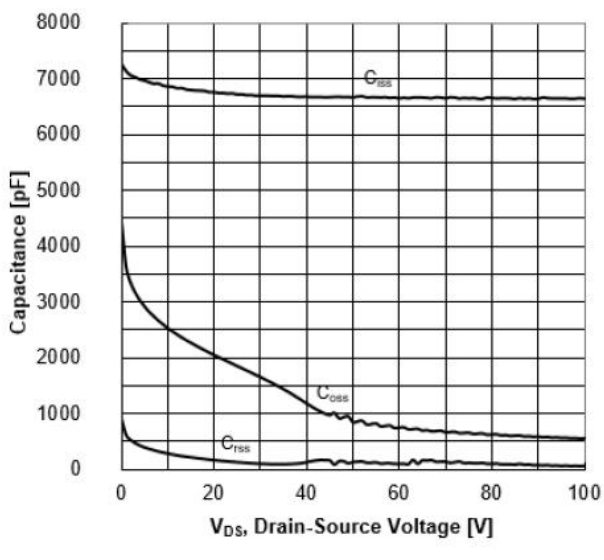


Figure 13. Typical Gate Charge vs Gate-Source Voltage