

1. General Description

KIA50N06C is an N-channel enhancement mode power MOSFET field effect transistor which is produced using KIA's LVMosfet technology. The improved process and cell structure have been especially tailored to minimize on-state resistance, provide superior switching performance. This device is widely used in UPS, Power Management for Inverter Systems.

2. Features

- $R_{DS(on)}=11m\Omega(typ.) @ V_{GS}=10V$
- Low gate charge
- Low C_{rss}
- Fast switching
- Improved dv/dt capability

3. Pin configuration



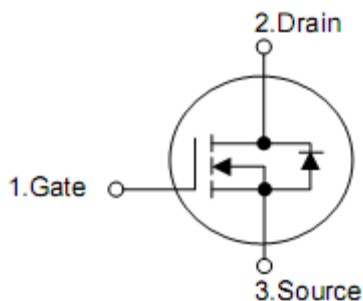
DFN5*6



TO-252



TO-220



Pin		Function
DFN5*6	TO-252/TO-220	
1,2,3	1	Gate
4	2	Drain
5,6,7,8	3	Source

4. Ordering Information

Part Number	Package	Brand
KIA50N06CY	DFN5*6	KIA
KIA50N06CD	TO-252	KIA
KIA50N06CP	TO-220	KIA

5. Absolute maximum ratings

(T_C= 25°C, unless otherwise noted)

Parameter		Symbol	Ratings		Units
			DFN5*6/TO-252	TO-220	
Drain-Source Voltage		V _{DSS}	60		V
Drain Current	T _C =25°C	I _D	50		A
	T _C =100°C		30		A
Drain Current -Pulsed		I _{DM}	200		A
Gate-Source Voltage		V _{GSS}	±20		V
Single Pulsed Avalanche Energy ¹⁾		E _{AS}	405		mJ
Power Dissipation	T _C =25°C	P _D	90	110	W
	Derate above 25°C		0.72	0.88	W/°C
Operating and Storage Temperature Range		T _J ,T _{STG}	-55 to +150		°C

6. Thermal Characteristics

Parameter	Symbol	Ratings		Units
		DFN5*6/TO-252	TO-220	
Thermal Resistance, Junction-to-Case	R _{θJC}	1.39	1.14	°C /W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	62.5	°C /W

7. Electrical characteristics

(T_C= 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	B _V DSS	V _{GS} =0V,I _D =250uA	60	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V,V _{GS} =0V	--	--	1	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250uA	1.1	1.6	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	--	11	13	mΩ
Gate Resistance	R _G	f=1.0MHz	--	3.5	--	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	--	2450	--	pF
Output Capacitance	C _{oss}		--	170	--	pF
Reverse Transfer Capacitance	C _{rss}		--	130	--	pF
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V,V _{GS} =10V, I _D =30A, R _G =25Ω ^{2),3)}	--	15	--	ns
Turn-On Rise Time	t _r		--	72	--	ns
Turn-Off Delay Time	t _{d(off)}		--	180	--	ns
Turn-Off Fall Time	t _f		--	79	--	ns
Total Gate Charge	Q _g	V _{DD} =48V,I _D =60A, V _{GS} =10V ^{2),3)}	--	52	--	nC
Gate-Source Charge	Q _{gs}		--	11	--	nC
Gate-Drain Charge	Q _{gd}		--	12	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	50	A
Pulsed Source Current	I _{SM}		--	--	200	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =20A	--	--	1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V,I _S =30A,	--	20	--	ns
Reverse Recovery Charge	Q _{rr}	dl _F /dt=100A/us ⁴⁾	--	0.02	--	uC

Notes:

1) L=10mH, V_{DD}=50V, R_G=10Ω, Starting T_J=25°C

2) Pulse Test: Pulse width ≤ 300us, Duty cycle≤2%

3) Essentially independent of operating temperature

8. Typical Characteristics

Figure 1. Output Characteristics

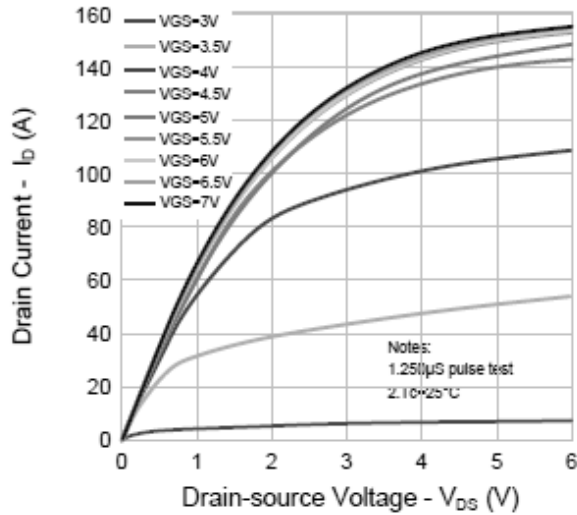


Figure 2. Transfer Characteristics

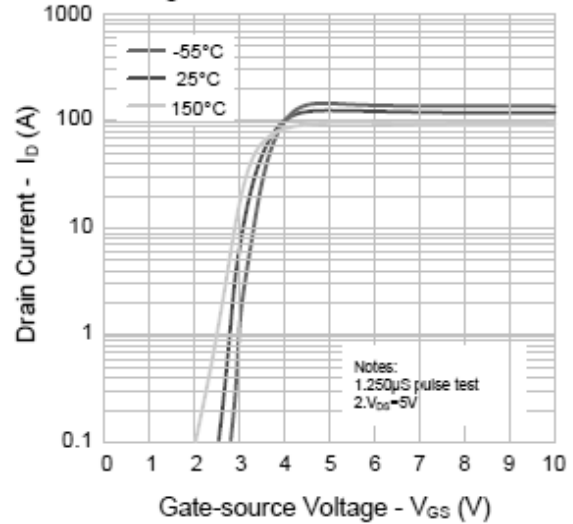


Figure 3. On-resistance vs. Drain Current

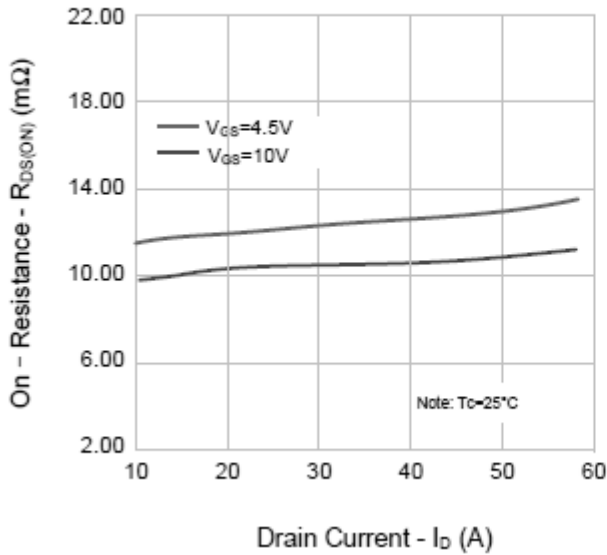


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

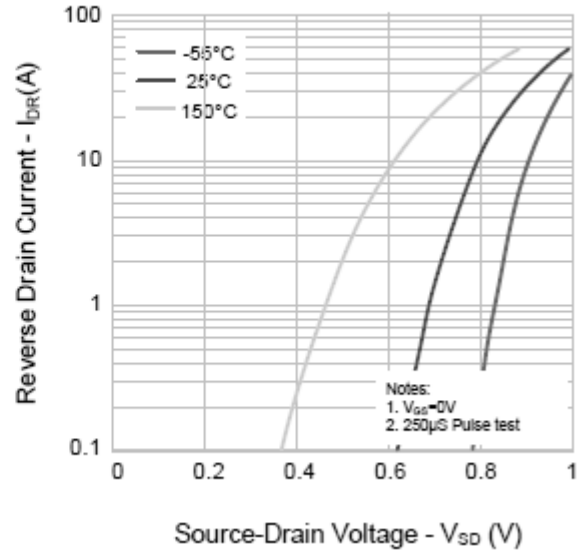


Figure 5. Capacitance Characteristics

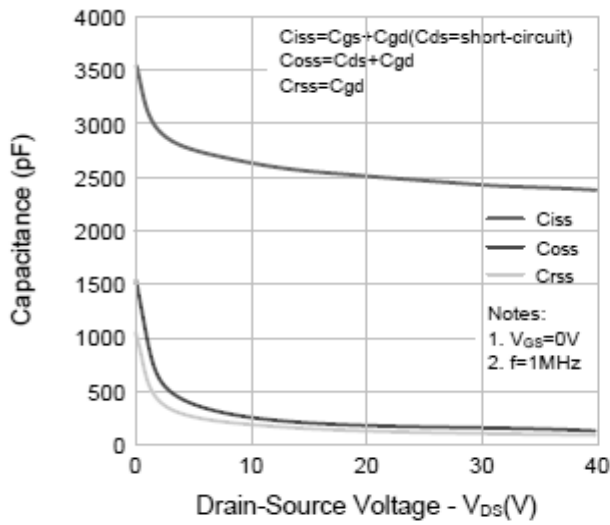


Figure 6. Gate Charge

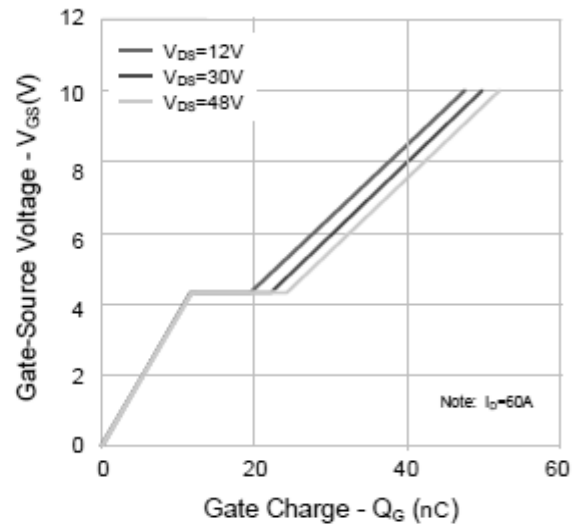


Figure 7. Breakdown Voltage vs. Temperature Characteristics

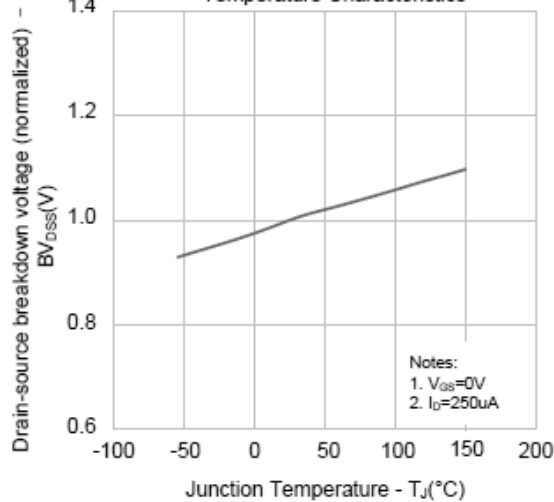


Figure 8. On-resistance vs. Temperature Characteristics

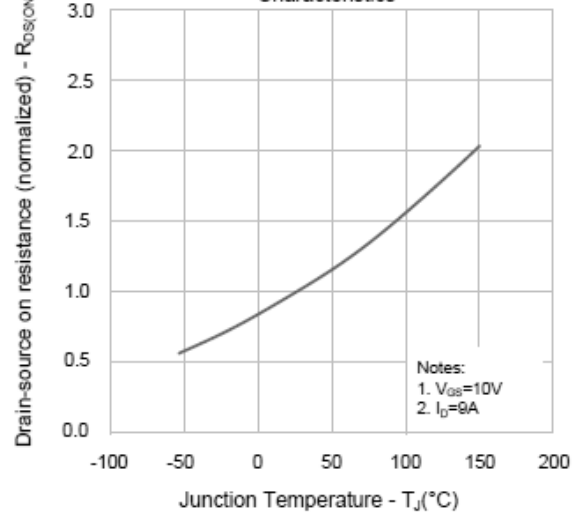


Figure 9-1. Max. Safe Operating Area (TO-220)

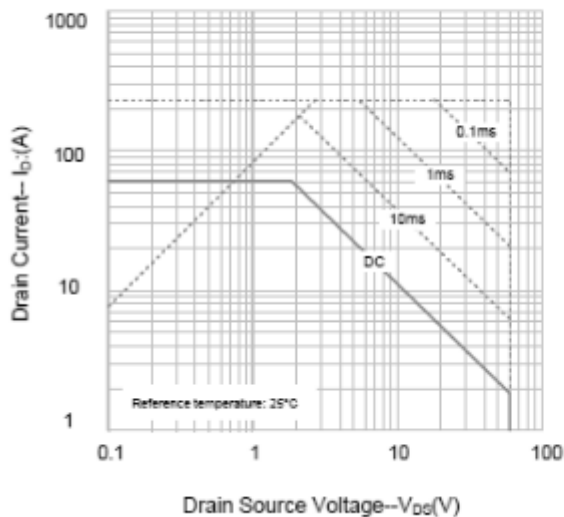


Figure 9-2. Max. Safe Operating Area (TO-252)

