

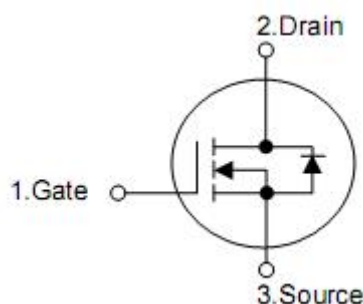
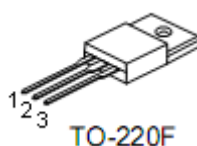
1. Description

The KIA10N60H N-Channel enhancement mode silicon gate power MOSFET is designed for high voltage, high speed power switching applications such as high efficiency switched mode power supplies, active power factor correction, electronic lamp ballasts based on half bridge topology.

2. Features

- n** $R_{DS(on)}=0.6\Omega$ @ $V_{GS}=10V$
- n** Low gate charge (typical 44nC)
- n** Fast switching capability
- n** avalanche energy specified
- n** Improved dv/dt capability

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source

4. Absolute maximum ratings

(TC= 25 °C , unless otherwise specified)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	600	V
Gate-source voltage		V_{GSS}	+30	V
Drain current continuous	$T_C=25^{\circ}\text{C}$	I_D	9.5*	A
	$T_C=100^{\circ}\text{C}$		5.7*	A
Drain current pulsed (note1)		I_{DP}	38.0*	A
Avalanche energy	Repetitive (note1)	E_{AR}	15.6	mJ
	Single pulse (note2)	E_{AS}	700	mJ
Peak diode recovery dv/dt (note3)		dv/dt	4.5	V/ns
Total power dissipation	$T_C=25^{\circ}\text{C}$	P_D	50	W
	derate above 25 °C		0.4	W/°C
Junction temperature		T_J	+150	°C
Storage temperature		T_{STG}	-55~+150	°C

* Drain current limited by maximum junction temperature.

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-ambient	R_{thJA}	62.5	°C/W
Thermal resistance,case-to-sink typ.	R_{thCS}	-	°C/W
Thermal resistance,Junction-case	R_{thJC}	2.5	°C/W

6. Electrical characteristics

(T_J=25°C, unless otherwise notes)

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage		BV _{DSS}	V _{GS} =0V,I _D =250μA	600	-	-	V
Zero gate voltage drain current		I _{DSS}	V _{DS} =600V ,V _{GS} =0V	-	-	1	μA
			V _{DS} =480V ,T _C =125 °C	-	-	10	μA
Gate-body leakage current	Forward	I _{GSS}	V _{GS} =30V,V _{DS} =0V	-	-	100	nA
	Reverse		V _{GS} =-30V,V _{DS} =0V	-	-	-100	nA
Breakdown voltage temperature coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA	-	0.7	-	V/°C
On characteristics							
Gate threshold voltage		V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Static drain-source on-resistance		R _{DS(on)}	V _{DS} =10V,I _D =4.75A	-	0.6	0.73	Ω
Dynamic characteristics							
Input capacitance		C _{iss}	V _{DS} =25V,V _{GS} =0V, f=1MHz	-	1570	2040	pF
Output capacitance		C _{oss}		-	166	215	pF
Reverse transfer capacitance		C _{rss}		-	18	24	pF
Switching characteristics							
Turn-on delay time		t _{d(on)}	V _{DD} =300V,I _D =9.5A, R _G =25Ω (note4,5)	-	23	55	ns
Rise time		t _r		-	69	150	ns
Turn-off delay time		t _{d(off)}		-	144	300	ns
Fall time		t _f		-	77	165	ns
Total gate charge		Q _g	V _{DS} =480V,I _D =9.5A , V _{GS} =10V (note4,5)	-	44	57	nC
Gate-source charge		Q _{gs}		-	6.7	-	nC
Gate-drain charge		Q _{gd}		-	18.5	-	nC
Drain-source diode characteristics							
Drain-source diode forward voltage		V _{SD}	V _{GS} =0V,I _{SD} =9.5A	-	-	1.4	V
Continuous drain-source current		I _{SD}		-	-	9.5	A
Pulsed drain-source current		I _{SM}		-	-	38.0	A
Reverse recovery time		t _{rr}	I _{SD} =9.5A dI _{SD} /dt=100A/μs (note4)	-	420	-	ns
Reverse recovery charge		Q _{rr}		-	4.2	-	μC

Note:1.repetitive rating:pulse width limited by maximum junctio/n temperature

2.L=14.2mH, I_{AS}=9.5A, V_{DD}=50V, R_G=25Ω, staring T_J=25°C

3.I_{SD}≤9.5A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, staring T_J=25 °C

4.Pulse test:pulse width≤300μs,duty cycle≤2%

5.Essentially independent of operating temperature

7. Test circuits and waveforms

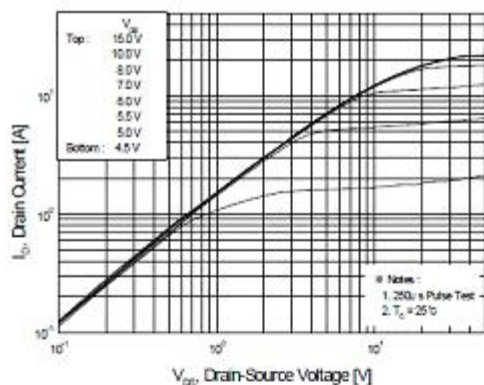


Figure 1. On-Region Characteristics

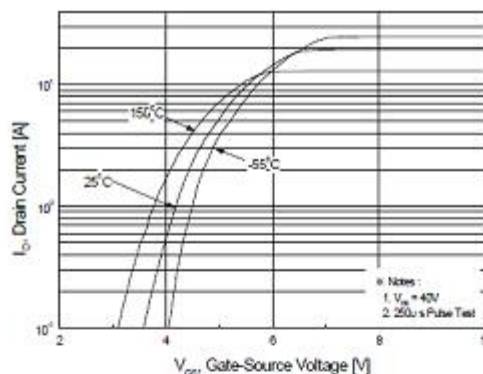


Figure 2. Transfer Characteristics

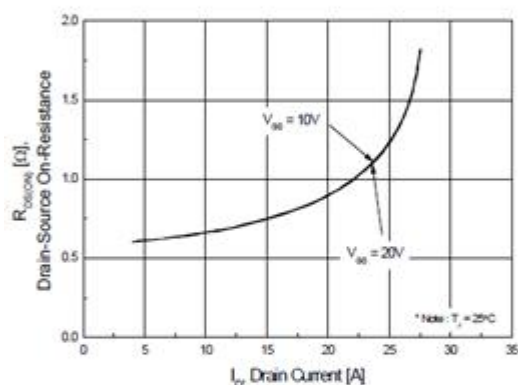


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

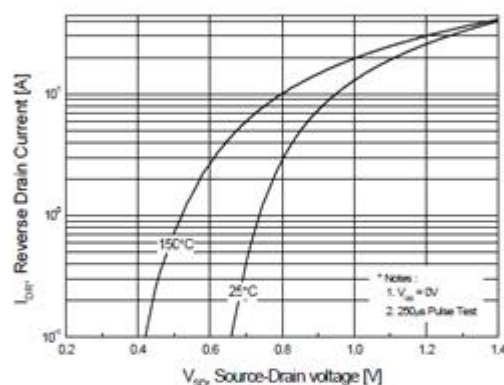


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

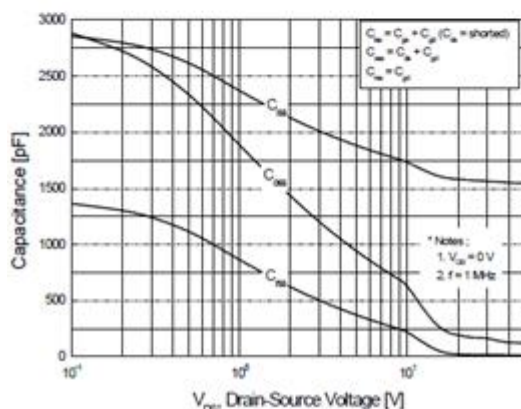


Figure 5. Capacitance Characteristics

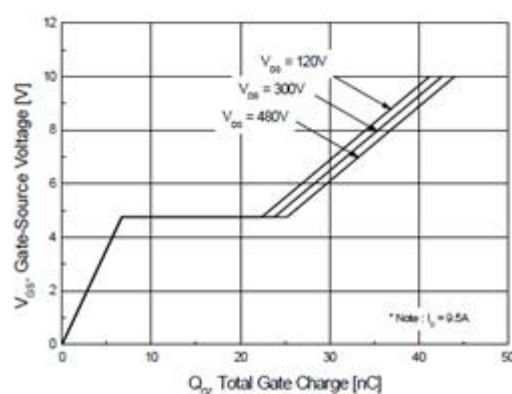


Figure 6. Gate Charge Characteristics

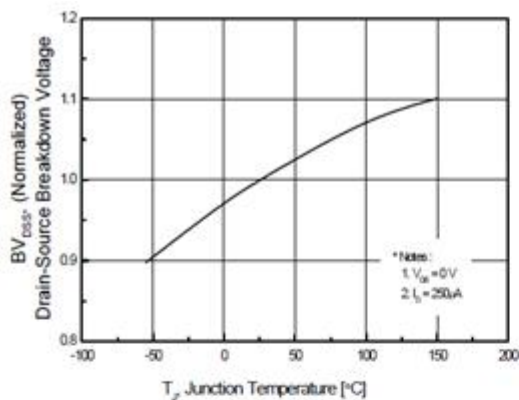


Figure 7. Breakdown Voltage Variation vs Temperature

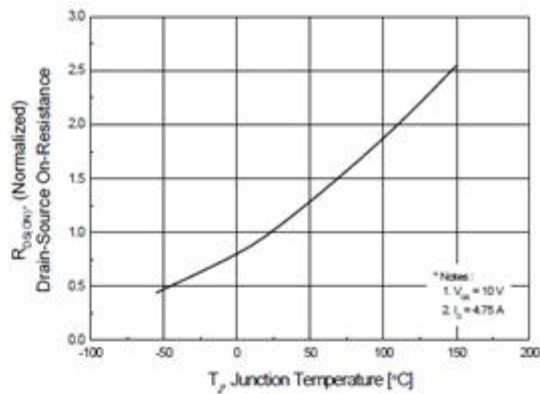


Figure 8. On-Resistance Variation vs Temperature

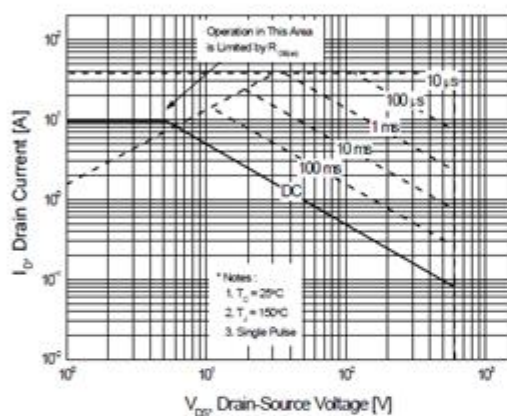


Figure 9. Maximum Safe Operating Area

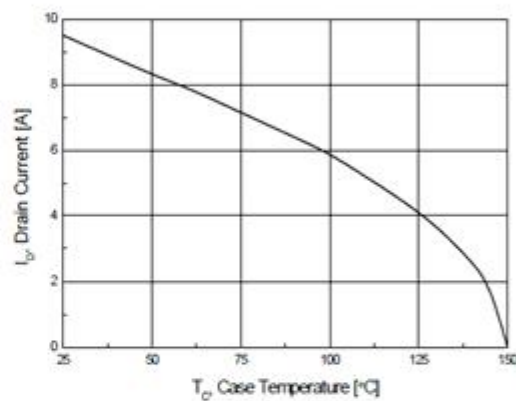


Figure 10. Maximum Drain Current vs Case Temperature

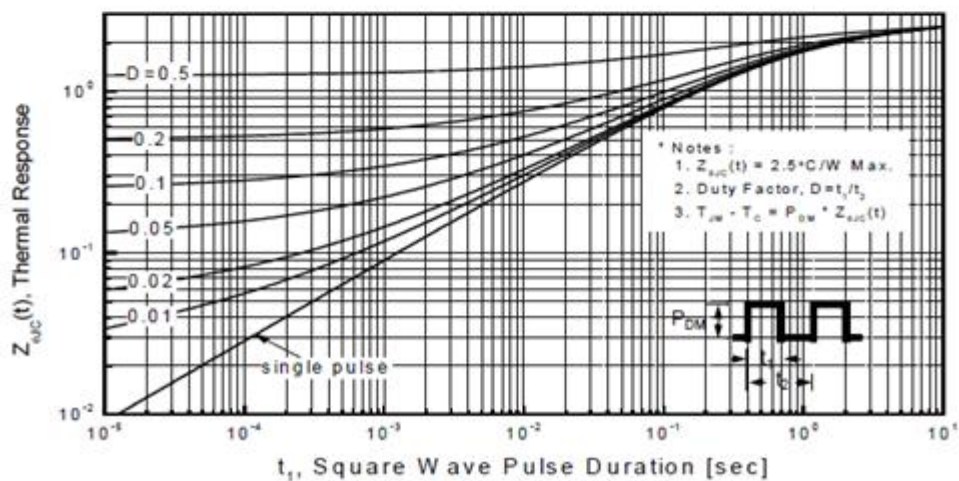


Figure 11. Transient Thermal Response Curve