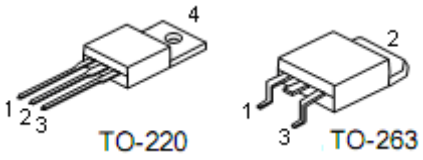
1. Description

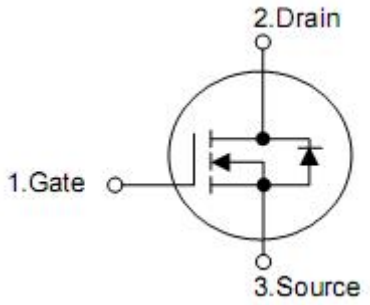
The KIA740H N-Channel enhancement mode silicon gate power MOSFET is designed for high voltage,high speed power switching applications such as switching regulators,switching converters,solenoid,motor drivers,relay drivers.

2. Features

- $R_{DS(on)}$= 0.45Ω @V_{GS}= 10 V
- Avalanche energy specified
- Rugge-SOA is power dissipation limited
- Fast switching capability
- Linear transfer characteristics
- High input impedance

3. Pin configuration





Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C=25 ºC , unless otherwise specified)

Parameter		Symbol	Ratings	Units
Drain-source voltage		V_{DSS}	400	V
Gate-source voltage		V_{GSS}	±30	V
Drain currenet continuous	T_c=25°C	I_D	10.0	A
	T_c=100°C		6.3	A
Drain current pulsed		I_{DP}	8.0	A
Avalanche energy	Repetitive	$E_{AR(Note\ 4)}$	13.9	mJ
	Single pulse	$E_{AS(Note\ 3)}$	378	mJ
Peak diode recovery dv/dt		dv/dt	4.5	V/ns
Total power dissipation	T_c=25°C	P_D	139	W
	Derate above 25°C		1.0	W/°C
Junction temperature		T_J	+150	°C
Storage temperature		T_{STG}	-55~+150	°C

Note:1.Absolute maximum ratings are those values beyond which the device could be permanently damaged

Absolute maximum ratings are stress ratings only and functional device operation is not implied

2.Repetitive Ratings:Pulse width limited bu maximum junction temperature

3.L = 6 mH, IAS = 10.5 A, VDD = 50V, RG = 25 Ω, Starting TJ = 25°C

4.Repetitive Rating : Pulse width limited by maximum junction temperature

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-to-case	θ_{JC}	1.0	ºC/W
Thermal resistance,Junction-to-ambient	θ_{JA}	62.5	ºC/W

6. Electrical characteristics

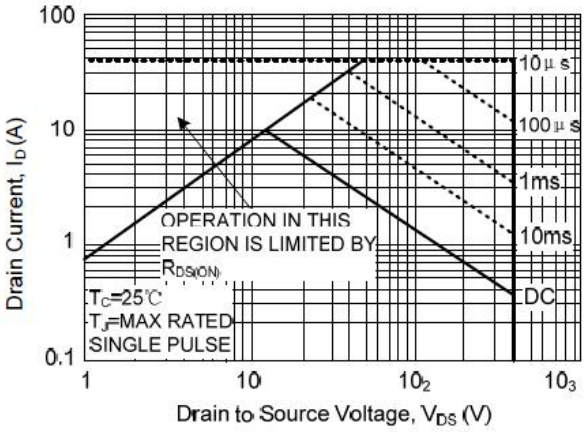
(T_J=25°C,unless otherwise notes)

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-source breakdown voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	400			V
Zero gate voltage drain current		I_{DSS}	V_{DS}=400V ,V_{GS}=0V			1	μA
			V_{DS}=320V ,T_C=125 ºC			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		$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA,		0.4		V/ºC
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_{GS}=10V,I_D=5.2A		0.45	0.50	Ω
Dynamic characteristics							
Input capacitance		C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1.0MHz		870		pF
Output capacitance		C_{oss}			250		pF
Reverse transfer capacitance		C_{rss}			85		pF
Switching characteristics							
Turn-on delay time		$t_{d(on)}$	V_{DD}=200V,I_D=10A,R_G=9.1Ω		15	21	ns
Rise time		t_r			25	41	ns
Turn-off delay time		$t_{d(off)}$			52	75	ns
Fall time		t_f			25	36	ns
Total gate charge		Q_g	V_{DS}=320V,I_D=10A,V_{GS}=10V,		41	63	nC
Gate-source charge		Q_{gs}			6.5		nC
Gate-drain charge		Q_{gd}			23		nC
Drain-source diode characteristics and maximum rating							
Drain-source diode forward voltage		V_{SD}	V_{GS}=0V,I_{SD}=10A			2.0	V
Continuous Drain-source current		I_{SD}				10	A
Pulsed Drain-source current		I_{SM}				40	A
Reverse recovery time		t_{rr}	I_{SD}=10A,dI_{SD}/dt=100A/μs	170	390	790	ns
Reverse recovery charge		Q_{rr}		1.6	4.5	8.2	μC

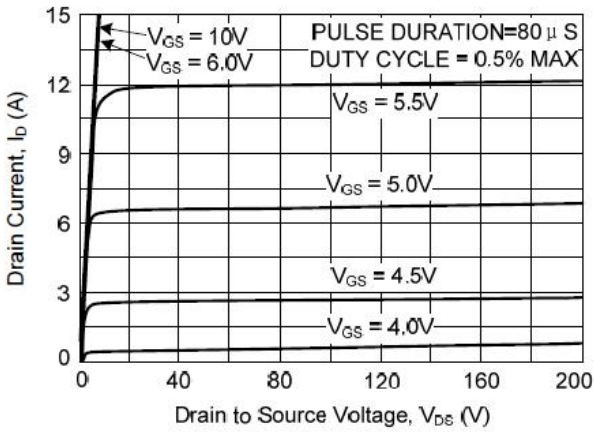
Note: 1.Pulse test:pulse width≤300μs,duty cycle≤2%

2.Essentially independent of operating temperature

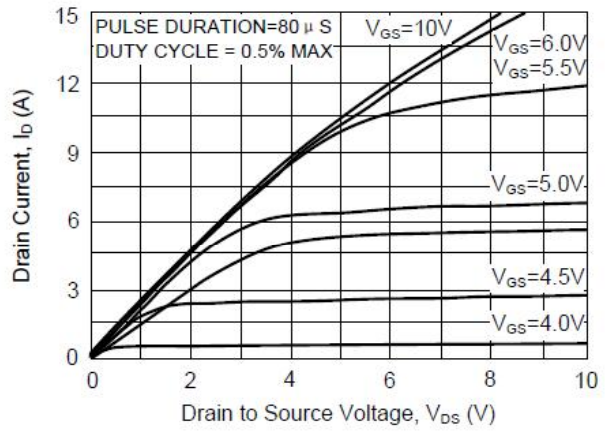
7. Test circuits and waveforms



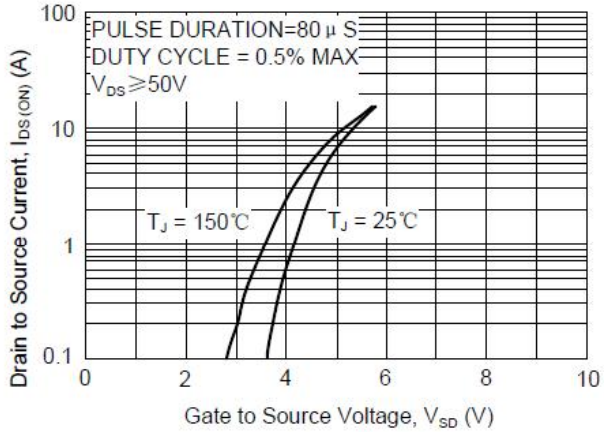
Forward Bias Safe Operating Area



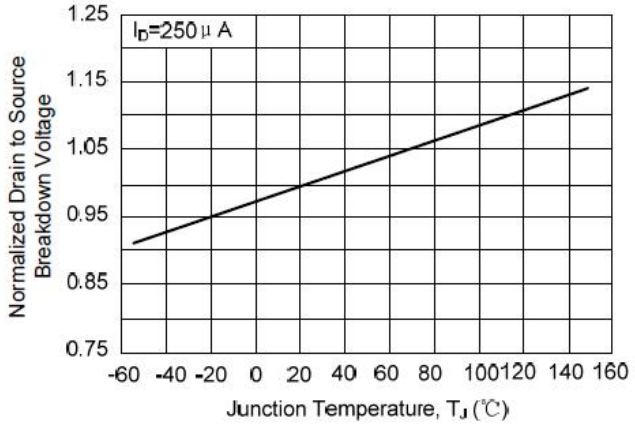
Output Characteristics



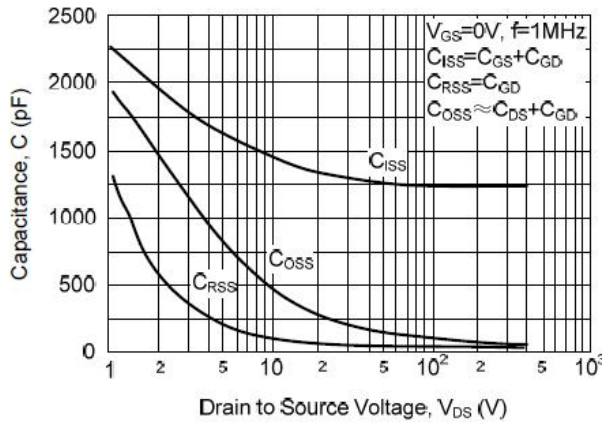
Saturation Characteristics



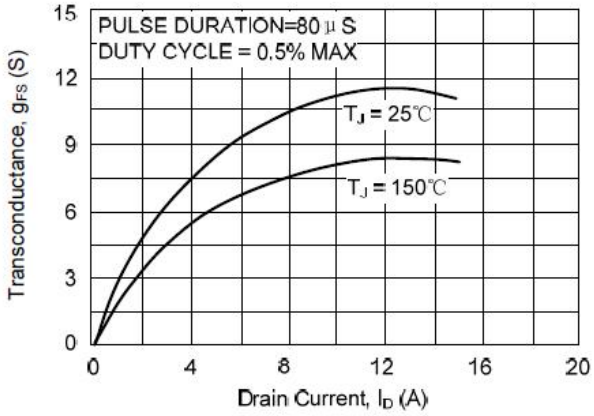
Transfer Characteristics



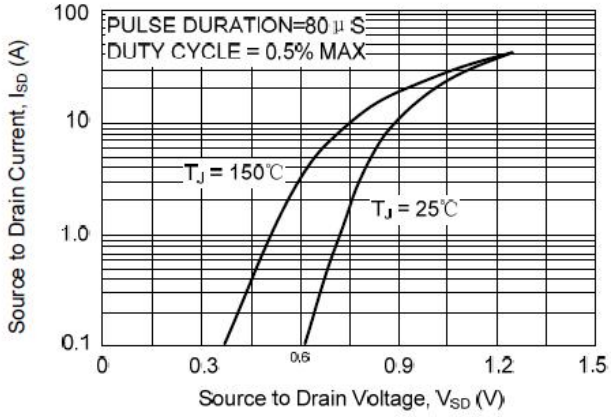
Normalized Drain to Source Breakdown Voltage vs. Junction Temperature



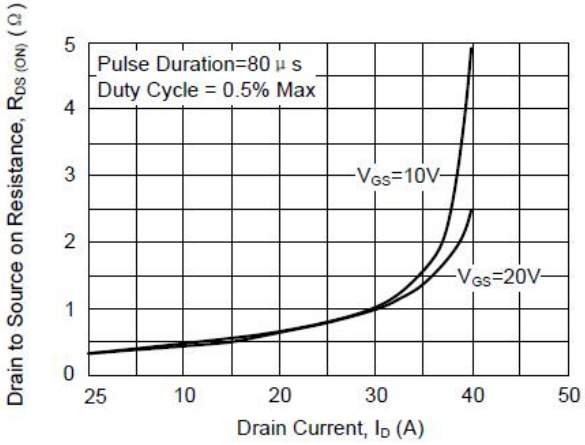
Capacitance vs. Drain to Source Voltage



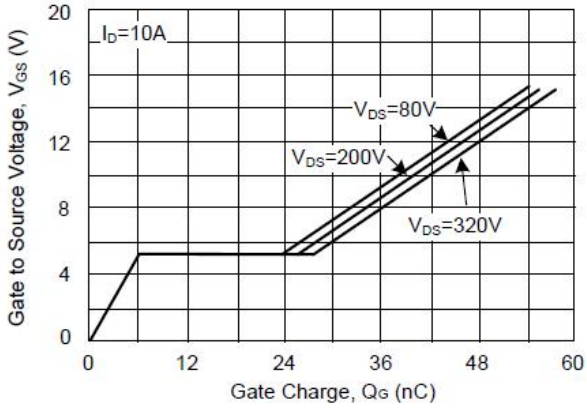
Transconduce vs. Drain Current



Source to Drain Diode Voltage



Drain to Source on Resistance vs. Voltage and Drain Current



Gate to Source Voltage vs. Gate Charge