

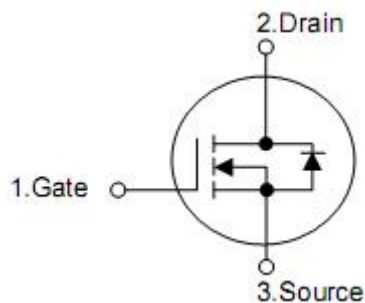
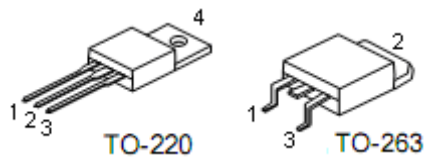
1. Description

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

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

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C=25 °C , unless otherwise specified)

Parameter		Symbol	Ratings	Units
Drain-source voltage		V _{DSS}	400	V
Gate-source voltage		V _{GSS}	±30	V
Drain current 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, R_G = 25 Ω, Starting T_J = 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	°C/W
Thermal resistance,Junction-to-ambient	θ _{JA}	62.5	°C/W

6. Electrical characteristics

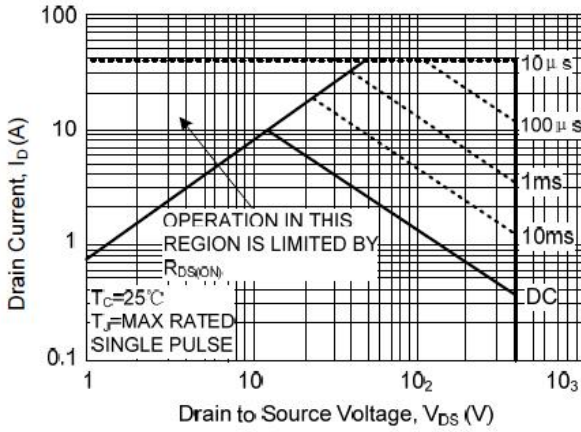
(T_J=25°C, unless otherwise notes)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	400			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =400V, V _{GS} =0V			1	μA
		V _{DS} =320V, T _C =125 °C			10	μA
Gate-body leakage current	Forward	I _{GSS}			100	nA
	Reverse					
					-100	nA
Breakdown voltage temperature	ΔBV _{DSS} /ΔT _J	I _D =250μA,		0.4		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 _{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

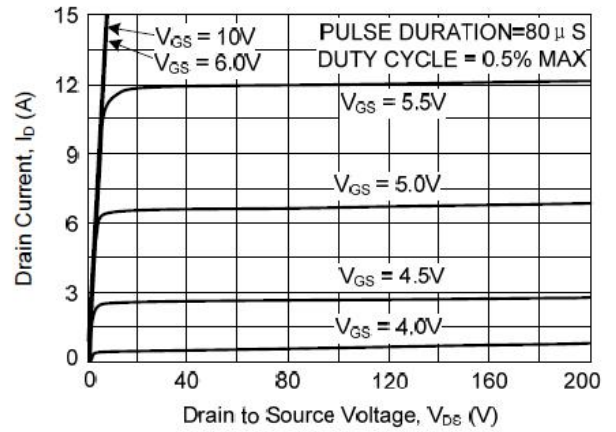
Note: 1.Pulse test:pulse width≤300μs,duty cycle≤2%

2.Essentially independent of operating temperature

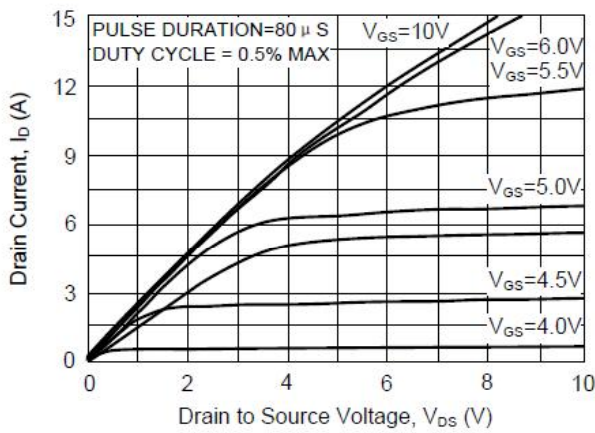
7. Test circuits and waveforms



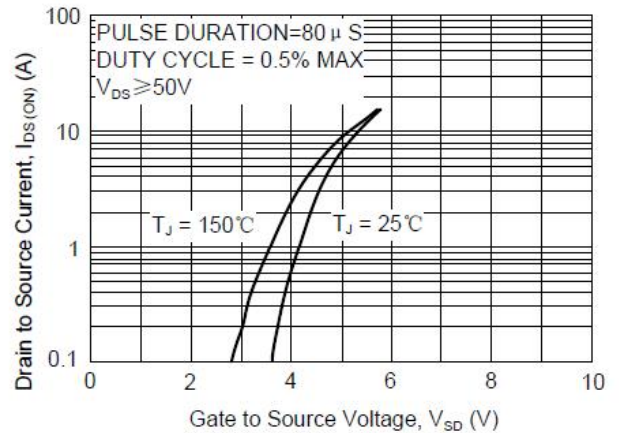
Forward Bias Safe Operating Area



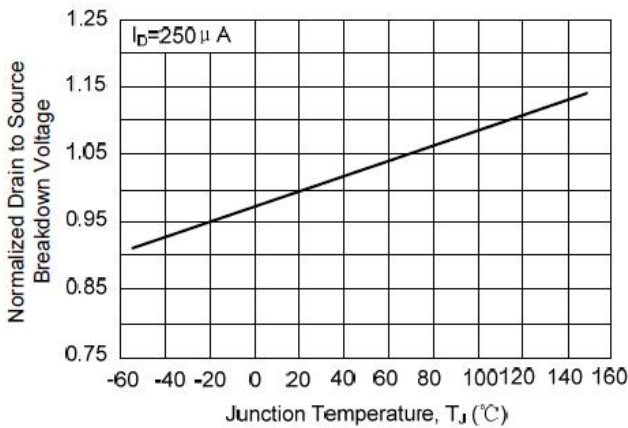
Output Characteristics



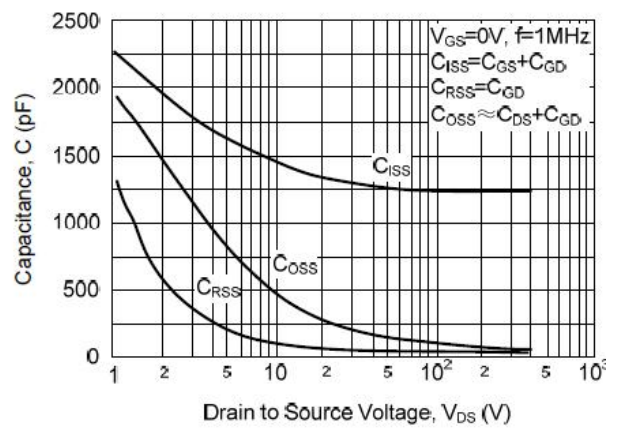
Saturation Characteristics



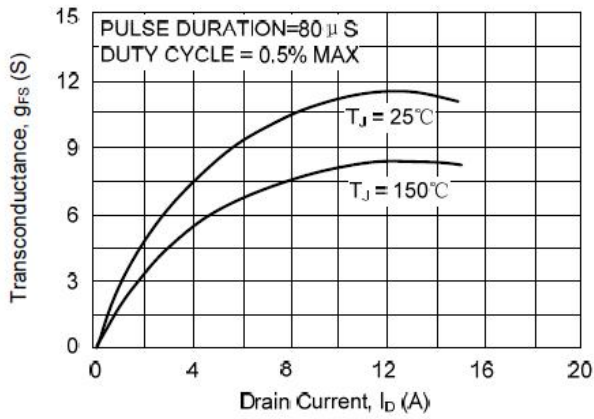
Transfer Characteristics



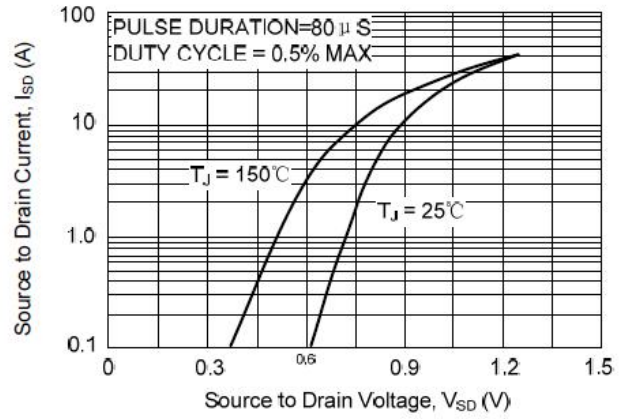
Normalized Drain to Source Breakdown Voltage vs. Junction Temperature



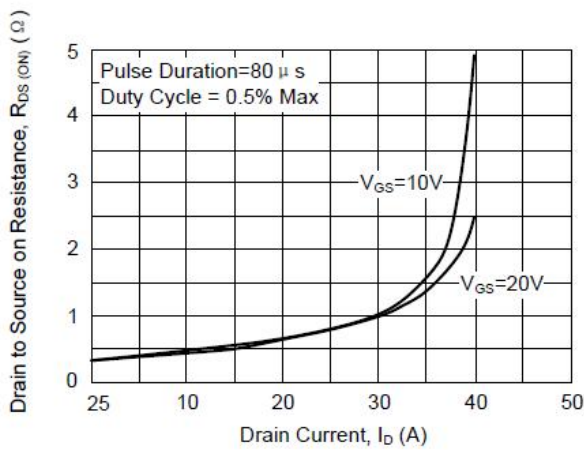
Capacitance vs. Drain to Source Voltage



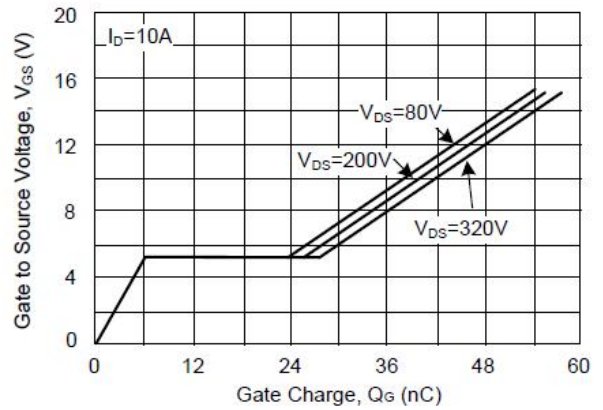
Transconduce vs. Drain Current



Source to Drain Diode Voltage



Drain to Source on Resistance vs. Voltage and Drain Current



Gate to Source Voltage vs. Gate Charge