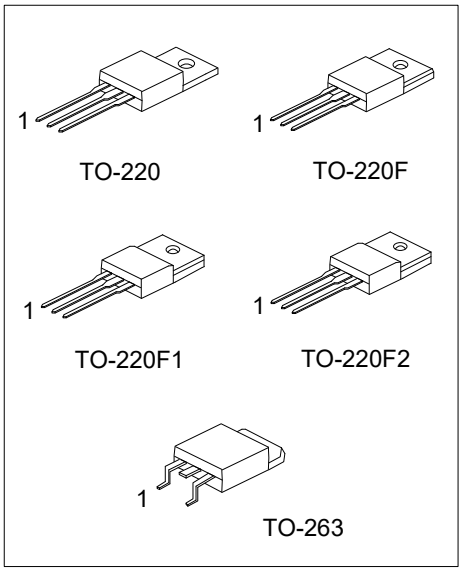
UF740 *Power MOSFET*

10A, 400V, 0.55Ω N-CHANNEL POWER MOSFET



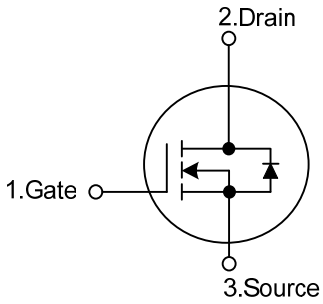
■ DESCRIPTION

The 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.

■ FEATURES

* $R_{DS(ON)} \leq 0.55\ \Omega$ @ V_{GS}=10V, I_D=5.2A
* Single Pulse Avalanche Energy Rated
* Rugged - SOA is Power Dissipation Limited
* Fast Switching Speeds
* Linear Transfer Characteristics
* High Input Impedance

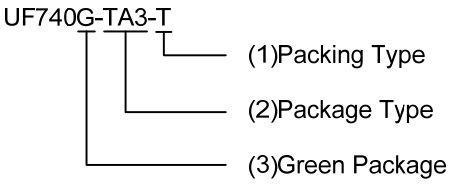
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF740L-TA3-T	UF740G-TA3-T	TO-220	G	D	S	Tube
UF740L-TF1-T	UF740G-TF1-T	TO-220F1	G	D	S	Tube
UF740L-TF2-T	UF740G-TF2-T	TO-220F2	G	D	S	Tube
UF740L-TF3-T	UF740G-TF3-T	TO-220F	G	D	S	Tube
UF740L-TQ2-T	UF740G-TQ2-T	TO-263	G	D	S	Tube
UF740L-TQ2-R	UF740G-TQ2-R	TO-263	G	D	S	Tape Reel

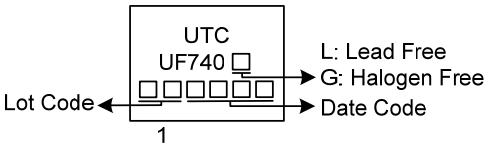
Note: Pin Assignment: G: Gate D: Drain S: Source



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TQ2: TO-263
(3) G: Halogen Free and Lead Free, L: Lead Free

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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, Unless Otherwise Specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage (T_J =25°C~125°C)		V_{DS}	400	V
Drain to Gate Voltage (R_{GS} = 20kΩ) (T_J =25°C~125°C)		V_{DGR}	400	V
Gate to Source Voltage		V_{GS}	±20	V
Drain Current	Continuous	I_D	10	A
	T_C = 100°C	I_D	6.3	A
	Pulsed	I_{DM}	40	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	520	mJ
Power Dissipation	TO-220/TO-263	P_D	125	W
	TO-220F/TO-220F1		44	W
	TO-220F2		46	W
Derating above 25°C	TO-220/TO-263		1.0	W/°C
	TO-220F/TO-220F1		0.35	W/°C
	TO-220F2		0.37	W/°C
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OPR}	-55 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 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 Rating: Pulse width limited by maximum junction temperature.
3. V_{DD}=50V, starting T_J =25°C, L=9.1mH, R_G=25Ω, peak I_{AS} = 10A

■ THERMAL DATA

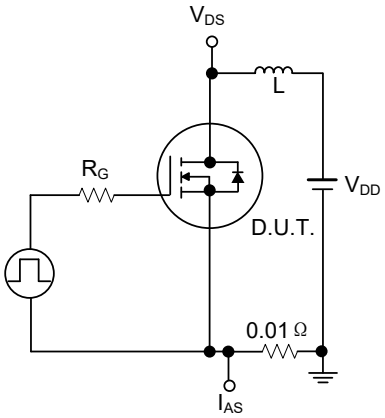
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
Junction to Case	TO-220/TO-263	θ_{Jc}	1.0	°C/W
	TO-220F/TO-220F1		2.86	°C/W
	TO-220F2		2.72	°C/W

■ ELECTRICAL CHARACTERISTICS (T_C =25°C, Unless Otherwise Specified)

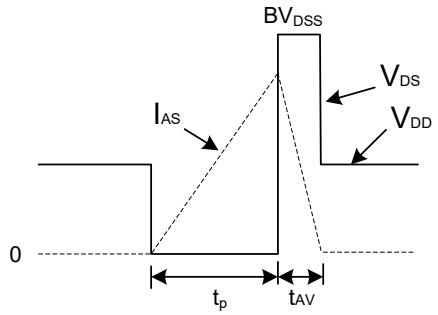
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain to Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	400			V
Gate to Threshold Voltage	$V_{GS(THR)}$	V_{GS} = V_{DS}, I_D = 250μA	2.0		4.0	V
On-State Drain Current (Note 1)	$I_{D(ON)}$	V_{DS} >$I_{D(ON)}$ x $R_{DS(ON)MAX}$, V_{GS} =10V	10			A
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = Rated BV_{DSS}, V_{GS} = 0V			25	μA
		V_{DS}=0.8 x Rated BV_{DSS}, V_{GS}=0V,T_J=125°C			250	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V			±500	nA
Drain to Source On Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 5.2A (Note 1)		0.38	0.55	Ω
Forward Transconductance	g_{FS}	V_{DS} ≥ 50V, I_D = 5.2A (Note 1)	5.8	8.9		S
Total Gate Charge (Gate to Source + Gate to Drain)	$Q_{G(TOT)}$	V_{GS} = 10V, I_D = 10A V_{DS} = 0.8 x Rated BV_{DSS}		43		nC
Gate to Source Charge	Q_{GS}	Gate Charge is Essentially Independent of Operating Temperature		11		nC
Gate to Drain “Miller” Charge	Q_{GD}			15		nC
Input Capacitance	C_{ISS}	V_{GS} = 0V, V_{DS} =25V, f = 1.0MHz		1170		pF
Output Capacitance	C_{OSS}			160		pF
Reverse - Transfer Capacitance	C_{RSS}			26		pF
Turn-On Delay Time	$t_{DLY(ON)}$	V_{DD} = 100V, I_D = 10A,R_L = 20Ω, V_{GS} = 10V MOSFET Switching Times are Essentially Independent of Operating Temperature		20	75	ns
Rise Time	t_R			23	145	ns
Turn-Off Delay Time	$t_{DLY(OFF)}$			106	260	ns
Fall Time	t_F			36	155	ns
Internal Drain Inductance	L_D	Measured From the Contact Screw on Tab to Center of Die		3.5		nH
		Measured From the Drain Lead, 6mm (0.25in) From Package to Center of Die		4.5		nH
Internal Source Inductance	L_S	Measured From the Source Lead, 6mm (0.25in) From Header to Source Bonding Pad		7.5		nH
SOURCE TO DRAIN DIODE SPECIFICATIONS						
Continuous Source to Drain Current	I_S	Modified MOSFET Symbol Showing the Integral Reverse P-N Junction Diode			10	A
Pulse Source to Drain Current (Note 2)	I_{SM}				40	A
Source to Drain Diode Voltage	V_{SD}	T_J = 25°C, I_{SD} = 10A, V_{GS} = 0V (Note 1)			2.0	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_{SD} = 10A, dI_{SD}/dt = 100A/μs	170	287	790	ns
Reverse Recovery Charge	Q_{rr}	T_J = 25°C, I_{SD} = 10A, dI_{SD}/dt = 100A/μs	1.6	3.1	8.2	μC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty Cycle≤2%.

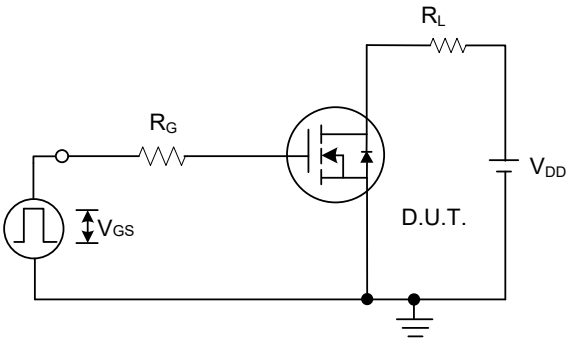
■ TEST CIRCUITS AND WAVEFORMS



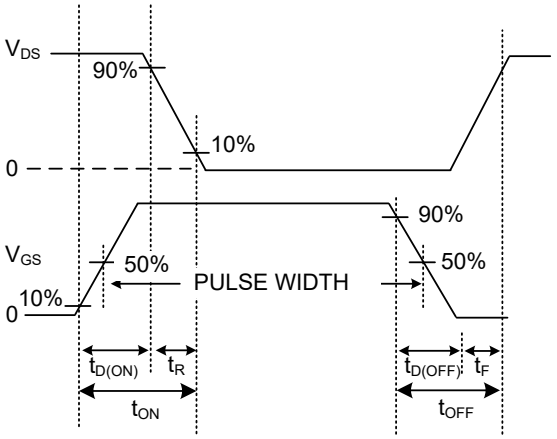
Unclamped Energy Test Circuit



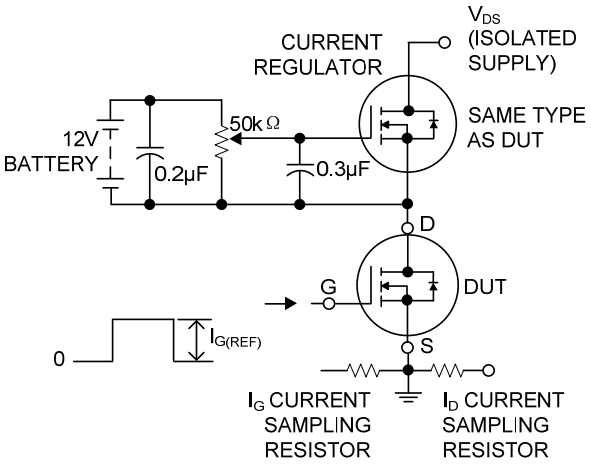
Unclamped Energy Waveforms



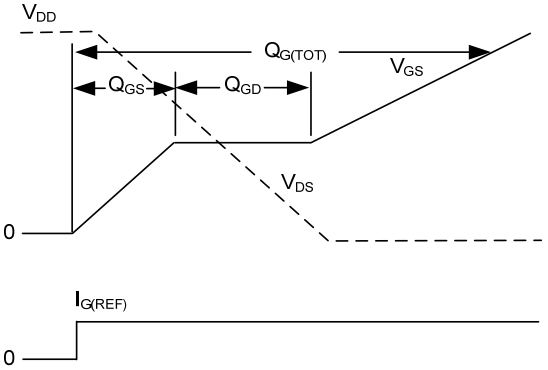
Switching Time Test Circuit



Resistive Switching Waveforms

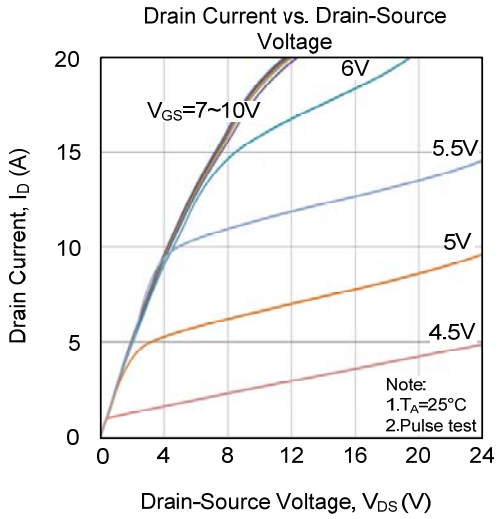


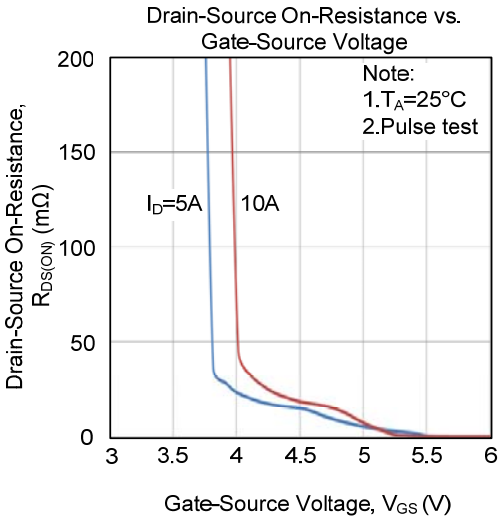
Gate Charge Test Circuit

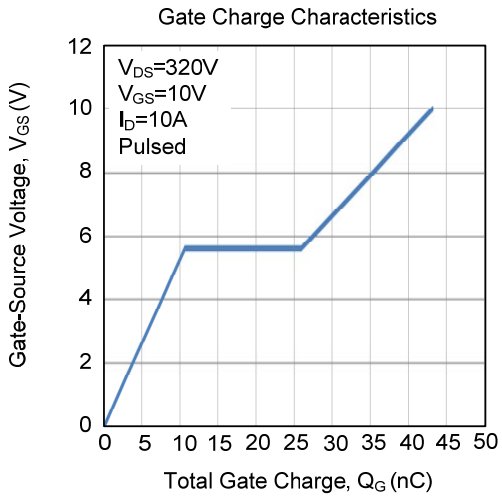


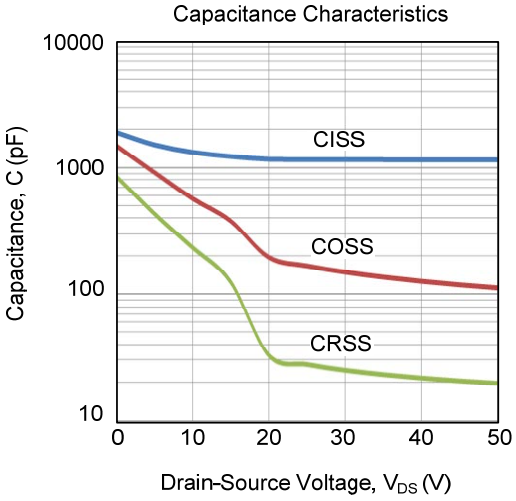
Gate Charge Waveforms

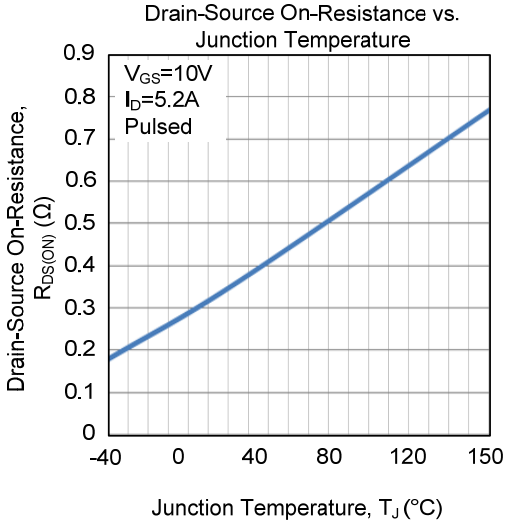
■ TYPICAL CHARACTERISTICS

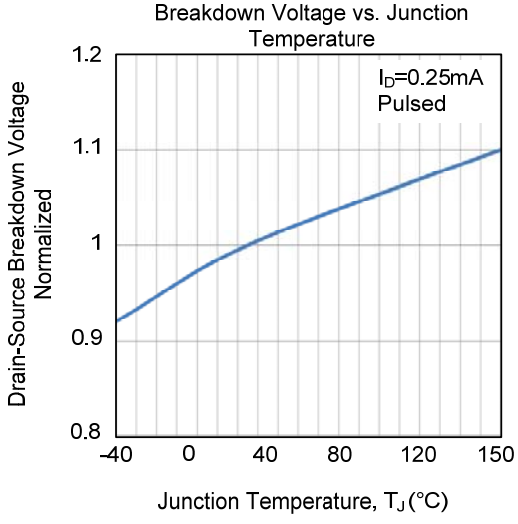




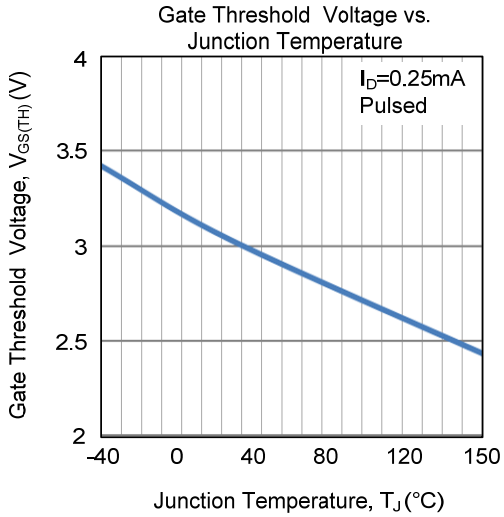


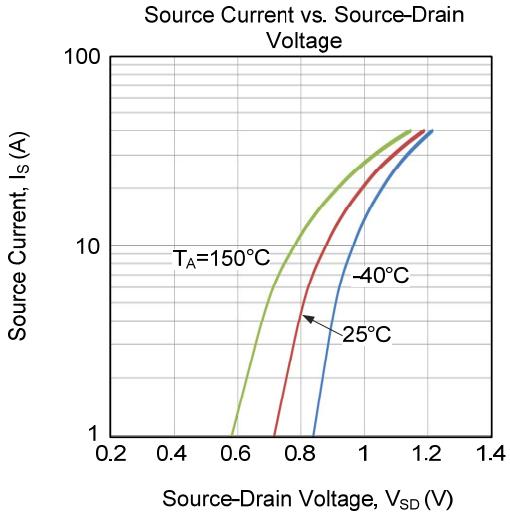


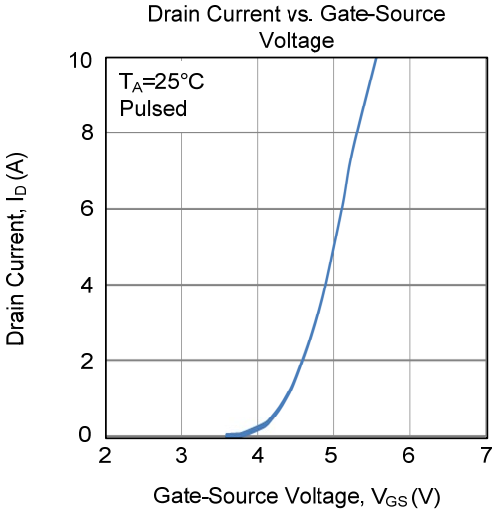


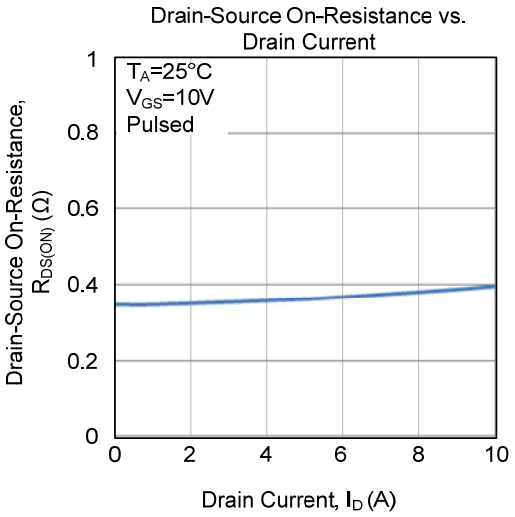


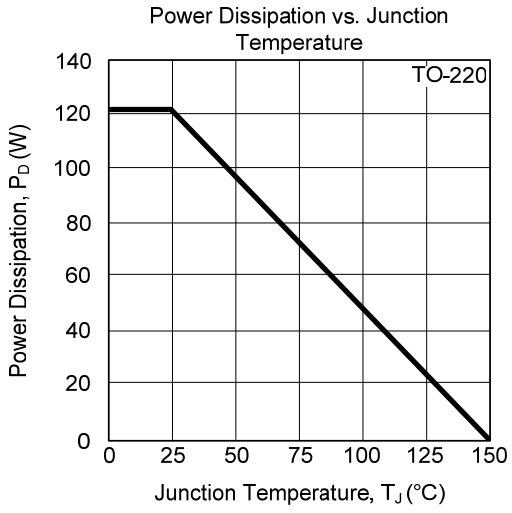
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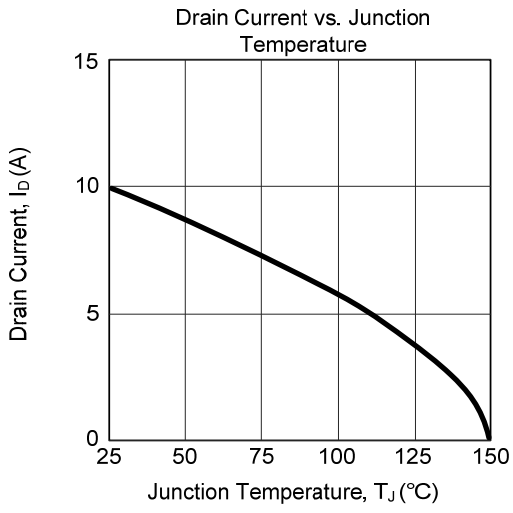




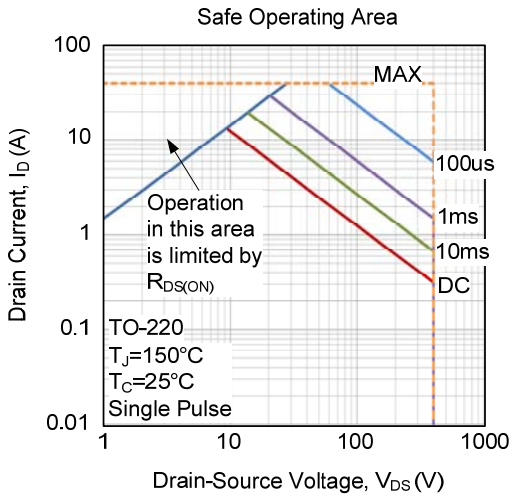








■ TYPICAL CHARACTERISTICS (Cont.)



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