



UF740K-MT

Power MOSFET

11A, 400V N-CHANNEL POWER MOSFET

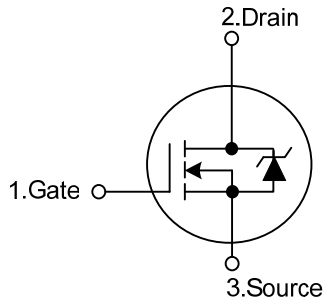
DESCRIPTION

The UTC **UF740K-MT** is a 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

- * $R_{DS(ON)} \leq 0.55 \Omega$ @ $V_{GS}=10V$, $I_D=5.5A$
- * Single Pulse Avalanche Energy Rated
- * Rugged - SOA is Power Dissipation Limited
- * Fast Switching Speeds
- * Linear Transfer Characteristics
- * High Input Impedance

SYMBOL

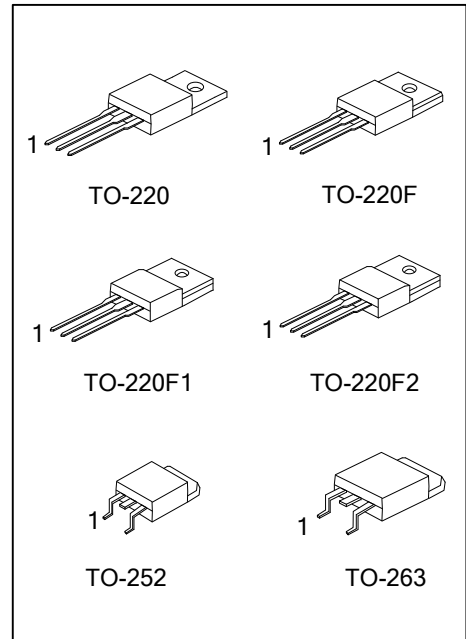


ORDERING INFORMATION

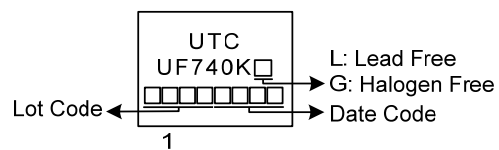
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF740KL-TA3-T	UF740KG-TA3-T	TO-220	G	D	S	Tube
UF740KL-TF3-T	UF740KG-TF3-T	TO-220F	G	D	S	Tube
UF740KL-TF1-T	UF740KG-TF1-T	TO-220F1	G	D	S	Tube
UF740KL-TF2-T	UF740KG-TF2-T	TO-220F2	G	D	S	Tube
UF740KL-TN3-R	UF740KG-TN3-R	TO-252	G	D	S	Tape Reel
UF740KL-TQ2-T	UF740KG-TQ2-T	TO-263	G	D	S	Tube
UF740KL-TQ2-R	UF740KG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UF740KG-TA3-T (1)Packing Type (2)Package Type (3)Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2. TN3: TO-252, 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-Source Voltage		V _{DSS}	400	V
Gate-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current	T _C =25°C	I _D	11	A
	T _C =100°C		6.5	A
Pulsed Drain Current (Note 2)		I _{DM}	22	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	437	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.8	V/ns
Power Dissipation	TO-220/TO-263	P _D	147	W
	TO-220F/TO-220F1		35	W
	TO-220F2		56	W
	TO-252		56	W
Junction Temperature		T _J	+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. L = 30mH, I_{AS} = 5.4A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

4. I_{SD} ≤ 11A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ _{JA}	62.5	°C/W
	TO-220F1/TO-220F2			
	TO-263			
	TO-252		110	°C/W
Junction to Case	TO-220/TO-263	θ _{JC}	0.85	°C/W
	TO-220F/TO-220F1		3.57	°C/W
	TO-220F2			
	TO-252		2.23 (Note)	°C/W

Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

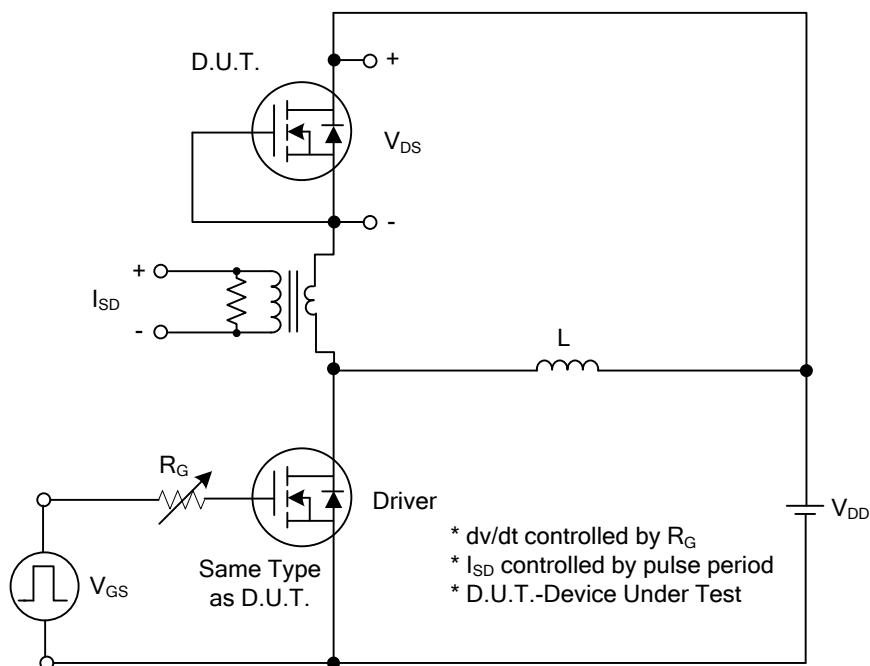
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	400			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =400V, V _{GS} =0V			10	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =30V, V _{DS} =0V			100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =5.5A			0.55	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		940		pF
Output Capacitance		C _{OSS}			125		pF
Reverse Transfer Capacitance		C _{RSS}			9.5		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =320V, V _{GS} =10V, I _D =11A I _G =1mA (Note 1, 2)		23		nC
Gate-Source Charge		Q _{GS}			5.4		nC
Gate-Drain Charge		Q _{GD}			5		nC
Turn-On Delay Time (Note 1)		t _{D(ON)}	V _{DS} =100V, V _{GS} =10V, I _D =11A, R _G =25Ω (Note 1, 2)		10		ns
Turn-On Rise Time		t _R			19		ns
Turn-Off Delay Time		t _{D(OFF)}			70		ns
Turn-Off Fall Time		t _F			27		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Body-Diode Continuous Current		I _S				11	A
Maximum Body-Diode Pulsed Current		I _{SM}				22	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =11A , V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =11A , V _{GS} =0V		410		ns
Reverse Recovery Charge		Q _{rr}	di/dt=100A/μs		7		μC

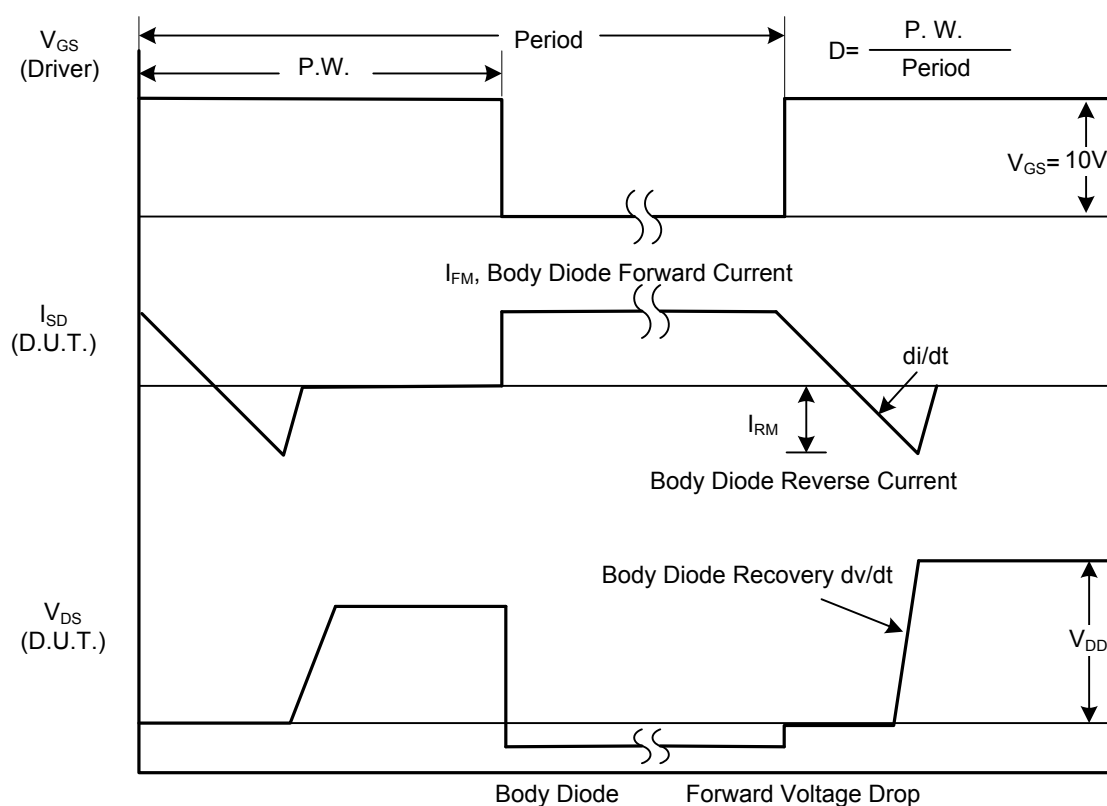
Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

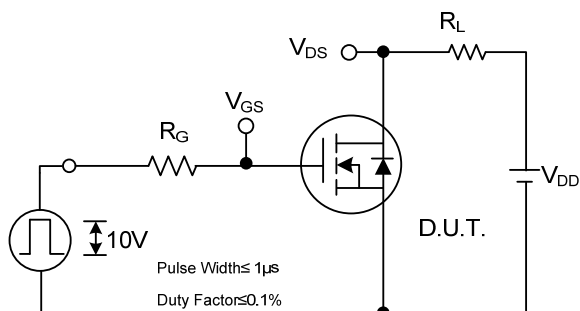


Peak Diode Recovery dv/dt Test Circuit

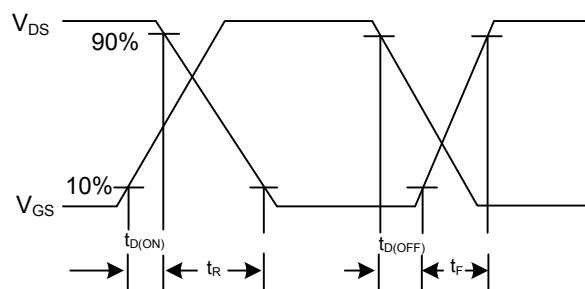


Peak Diode Recovery dv/dt Waveforms

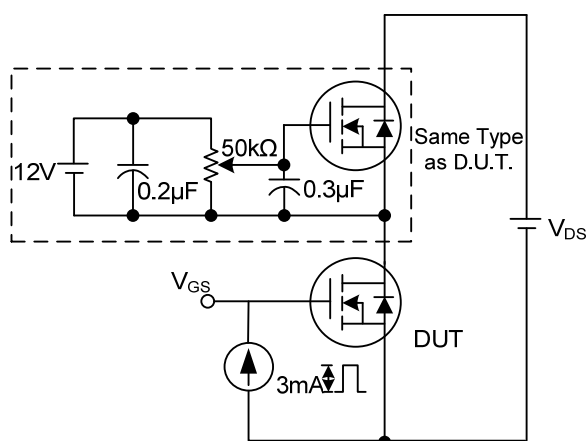
■ TEST CIRCUITS AND WAVEFORMS



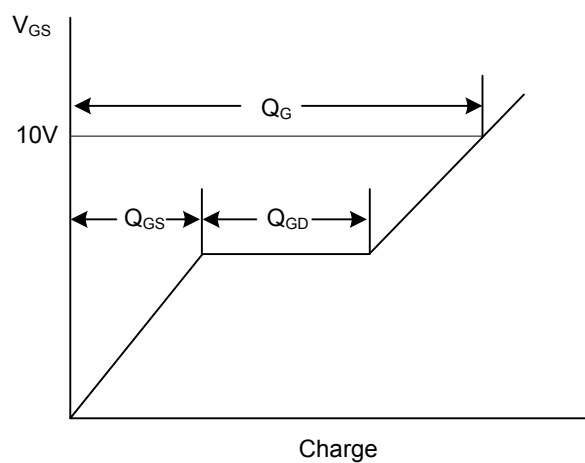
Switching Test Circuit



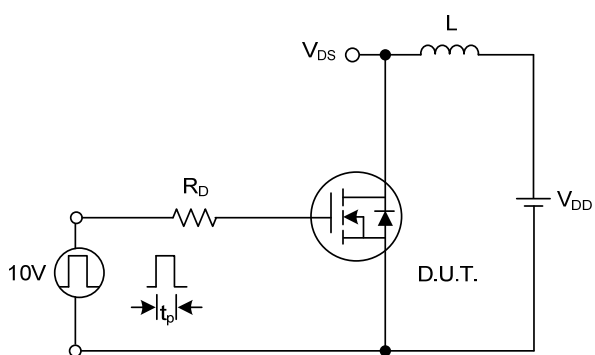
Switching Waveforms



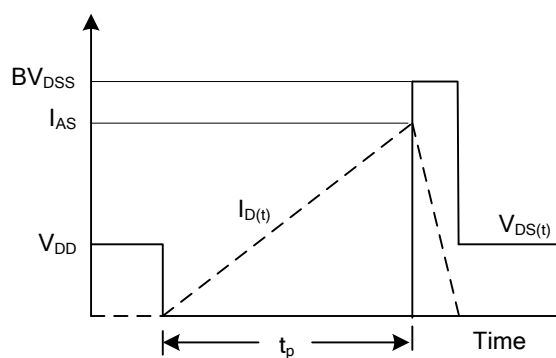
Gate Charge Test Circuit



Gate Charge Waveform

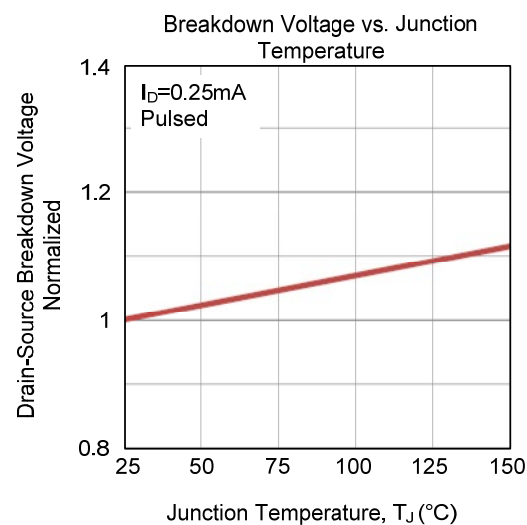
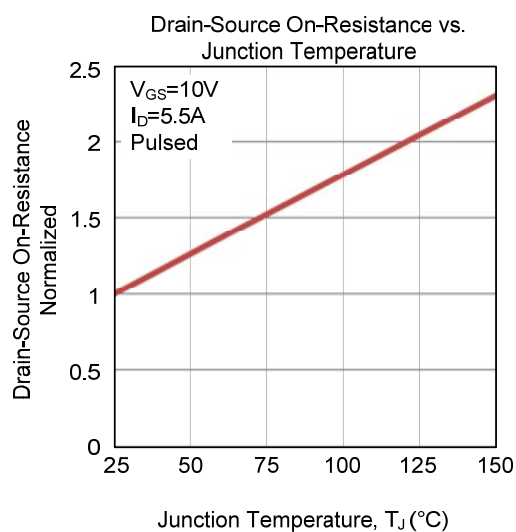
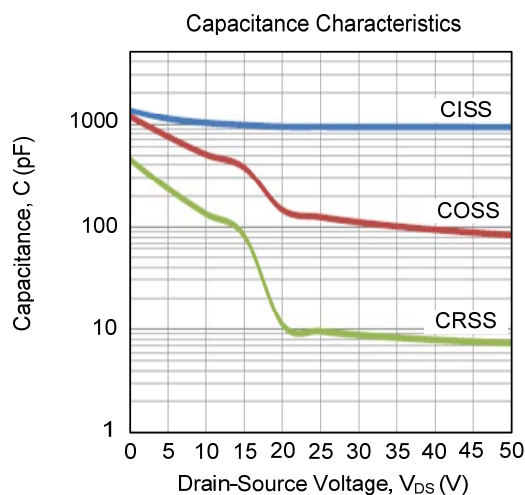
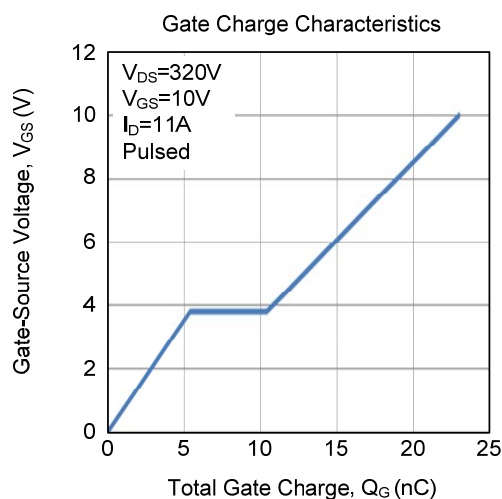
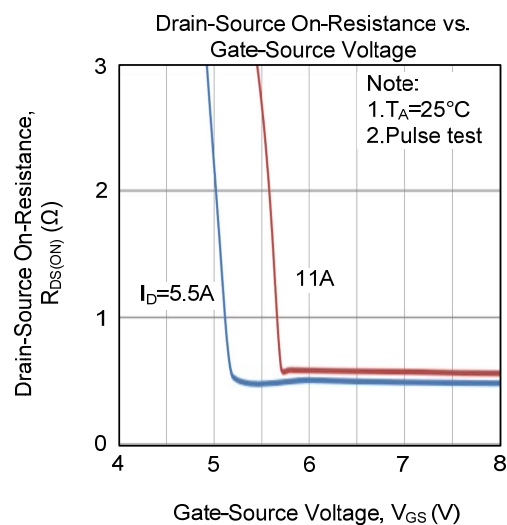
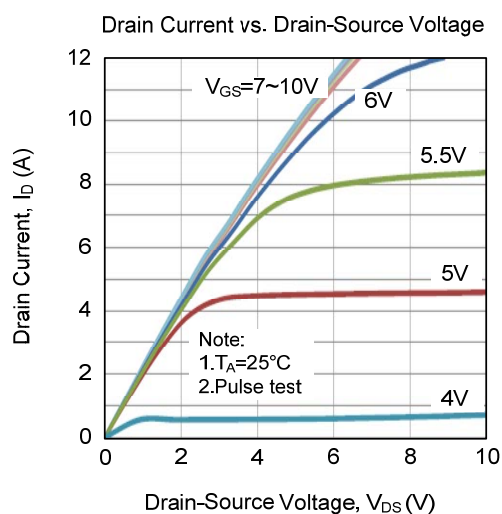


Unclamped Inductive Switching Test Circuit

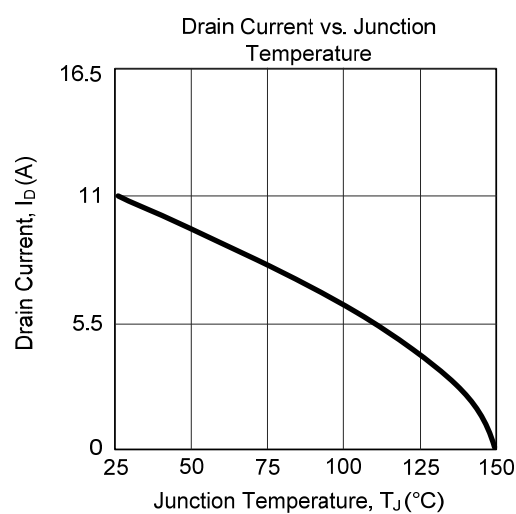
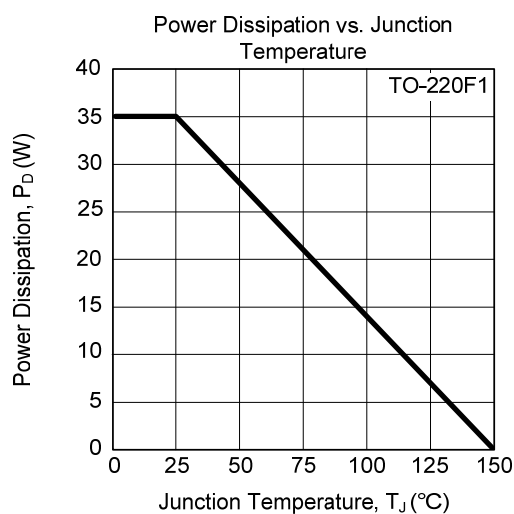
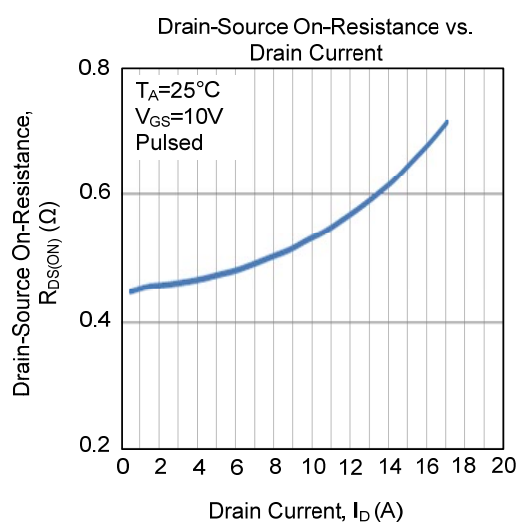
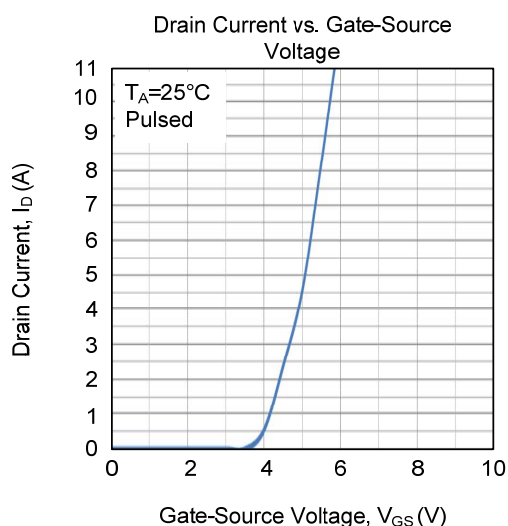
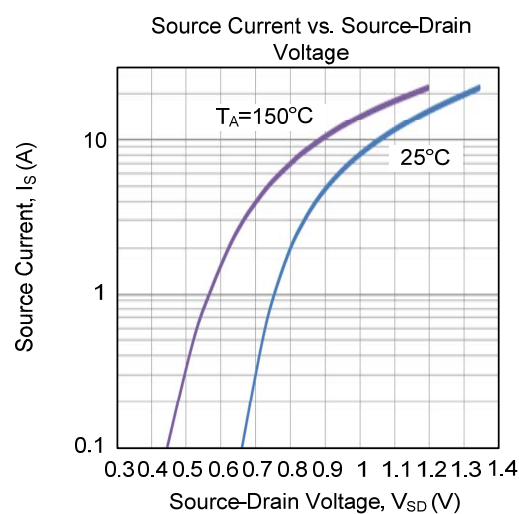
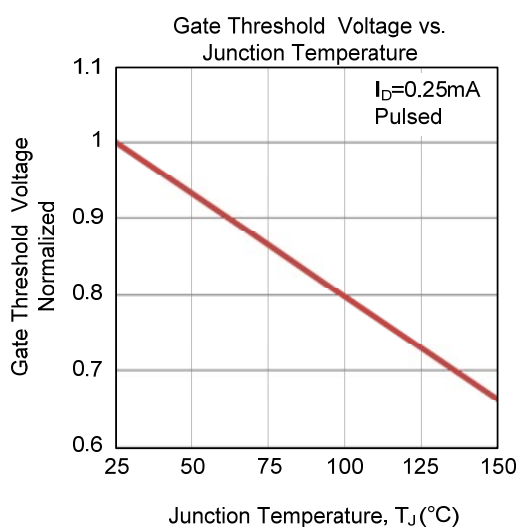


Unclamped Inductive Switching Waveforms

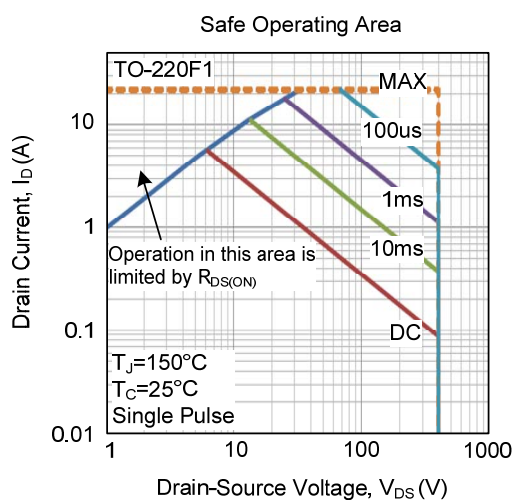
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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