



10N65K-MT

Power MOSFET

10A, 650V N-CHANNEL POWER MOSFET

DESCRIPTION

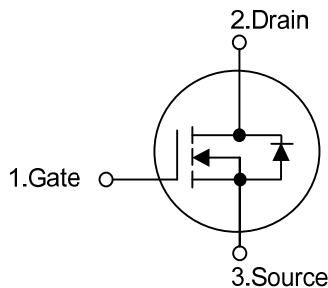
The UTC **10N65K-MT** is an N-channel Power MOSFET using UTC's advanced technology to provide customers a minimum on-state resistance and superior switching performance, etc.

The UTC **10N65K-MT** is generally applied in high efficient DC to DC converters, PWM motor controls and bridge circuits, etc.

FEATURES

- * $R_{DS(ON)} < 0.82\Omega$ @ $V_{GS}=10V$, $I_D = 5.0A$
- * High Switching Speed
- * Improved dv/dt capability

SYMBOL

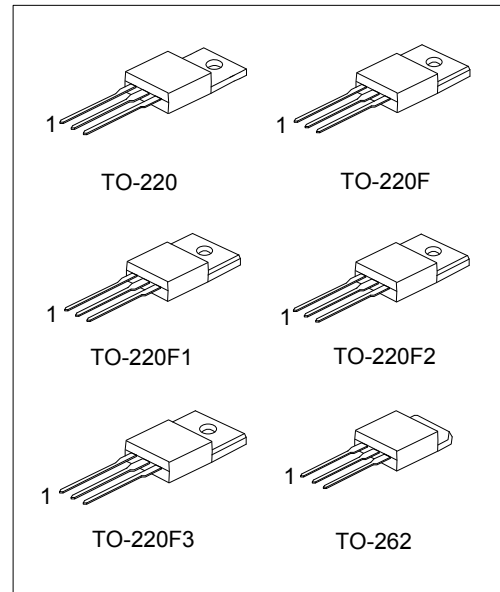


ORDERING INFORMATION

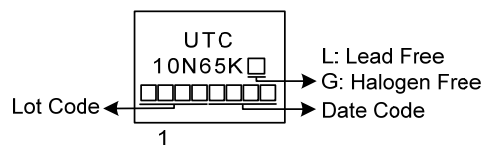
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10N65KL-TA3-T	10N65KG-TA3-T	TO-220	G	D	S	Tube
10N65KL-TF3-T	10N65KG-TF3-T	TO-220F	G	D	S	Tube
10N65KL-TF1-T	10N65KG-TF1-T	TO-220F1	G	D	S	Tube
10N65KL-TF2-T	10N65KG-TF2-T	TO-220F2	G	D	S	Tube
10N65KL-TF3T-T	10N65KG-TF3T-T	TO-220F3	G	D	S	Tube
10N65KL-T2Q-T	10N65KG-T2Q-T	TO-262	G	D	S	Tube

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

10N65KG-TA3-T	(1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1 TF2: TO-220F2, TF3T: TO-220F3, T2Q: TO-262 (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}	650	V
Gate-Source Voltage		V _{GSS}	±30	V
Drain Current	Continuous	I _D	10	A
	Pulsed (Note 2)	I _{DM}	40	A
Avalanche Current (Note 2)		I _{AR}	7.4	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	274	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.7	V/ns
Power Dissipation	TO-220/TO-262	P _D	156	W
	TO-220F/TO-220F1		50	W
	TO-220F3		48	W
	TO-220F2		48	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=10mH, I_{AS}=7.4A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C

4. I_{SD} ≤ 10A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient		θ _{JA}	62.5	°C/W
Junction to Case	TO-220/TO-262	θ _{JC}	0.8	°C/W
	TO-220F/TO-220F1		2.5	°C/W
	TO-220F3		2.5	°C/W
	TO-220F2		2.6	°C/W

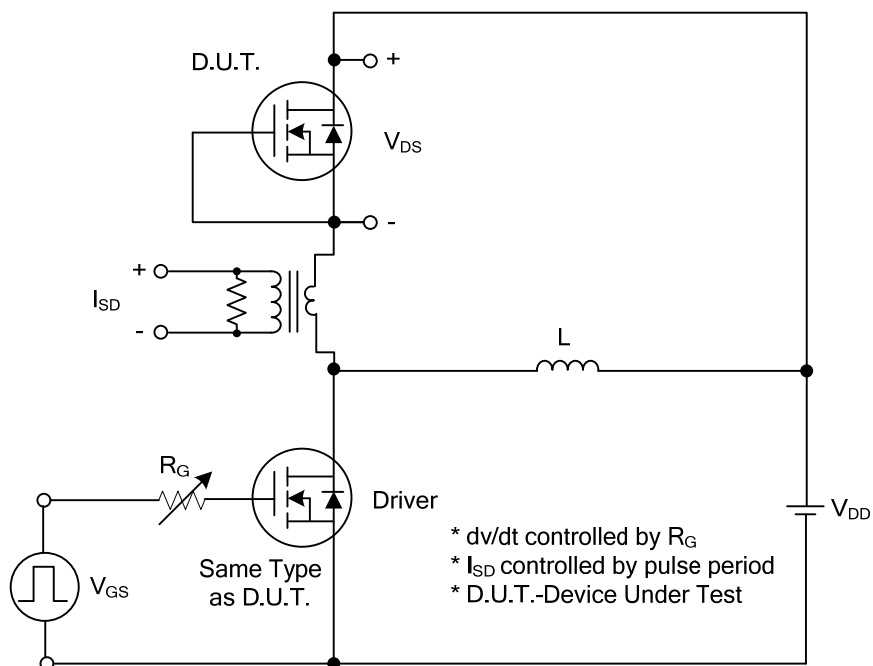
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30 V, V _{DS} = 0 V			100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0 V			-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 = 5.0A			0.82	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz		1650		pF
Output Capacitance		C _{OSS}			140		pF
Reverse Transfer Capacitance		C _{RSS}			6		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =200V, I _D =5.0A, V _{GS} =10V I _G =3mA (Note1, 2)		35		nC
Gate to Source Charge		Q _{GS}			12.5		nC
Gate to Drain Charge		Q _{GD}			6.5		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, I _D =0.5A, R _G =25Ω, V _{GS} =10V (Note1, 2)		65		ns
Rise Time		t _R			80		ns
Turn-OFF Delay Time		t _{D(OFF)}			200		ns
Fall-Time		t _F			90		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				10	A
Maximum Body-Diode Pulsed Current		I _{SM}				40	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	V _{GS} = 0 V, I _S =10A			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	V _{GS} =0V, I _S =10A,		510		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs (Note1)		4.7		μC

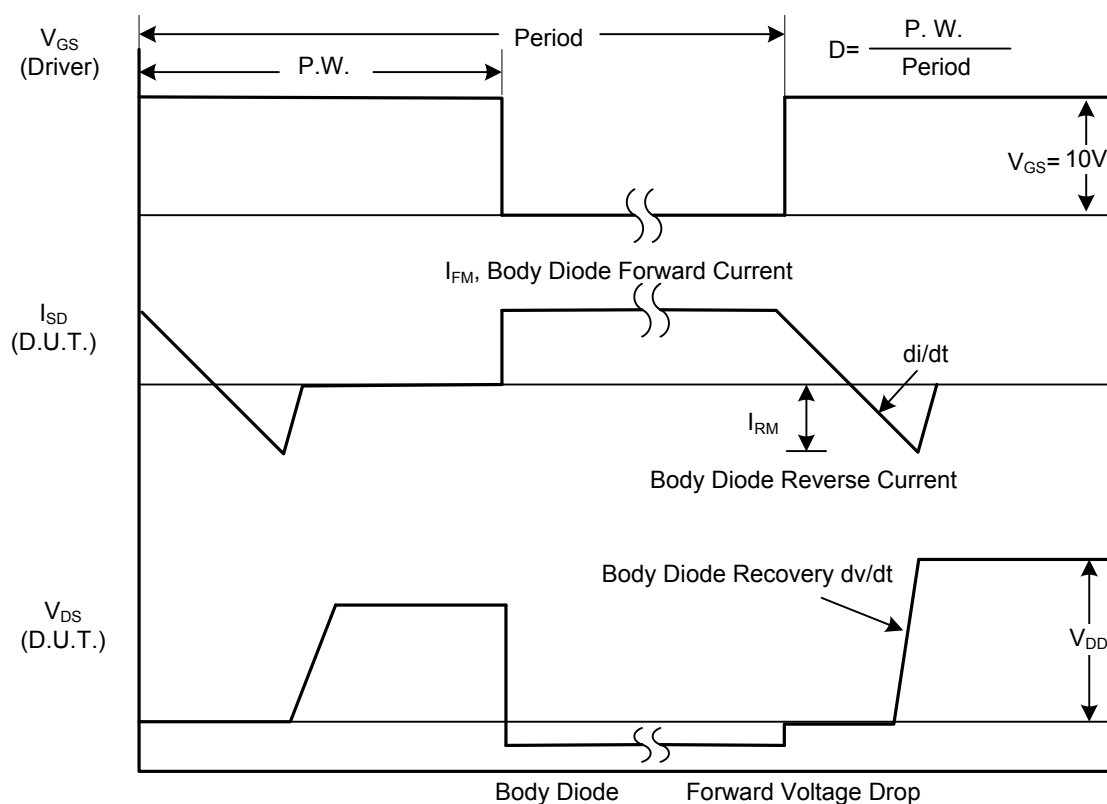
Note: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

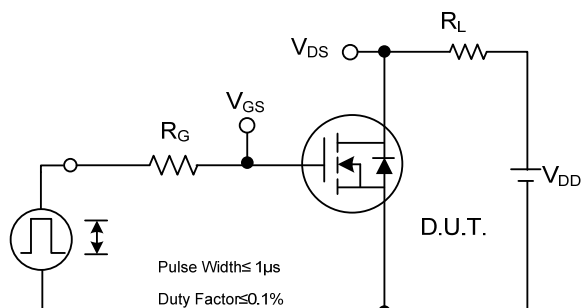


Peak Diode Recovery dv/dt Test Circuit

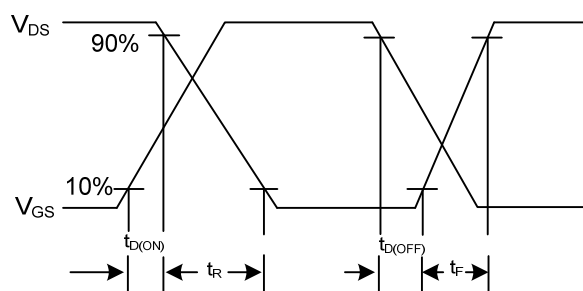


Peak Diode Recovery dv/dt Waveforms

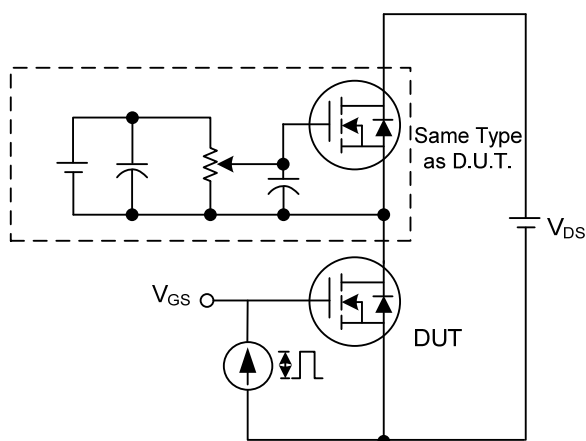
■ TEST CIRCUITS AND WAVEFORMS



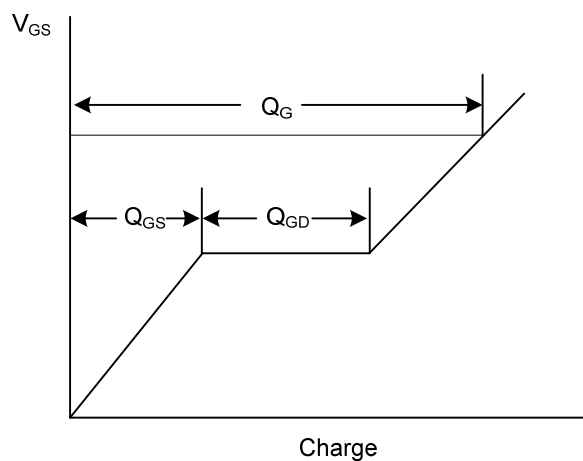
Switching Test Circuit



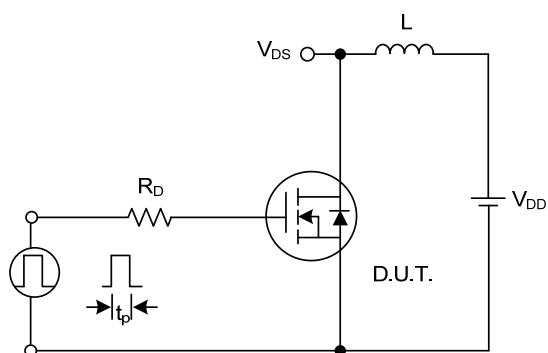
Switching Waveforms



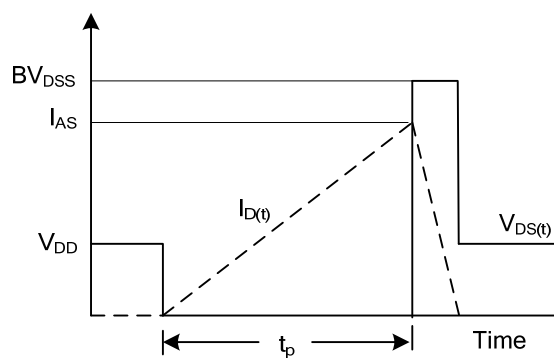
Gate Charge Test Circuit



Gate Charge Waveform

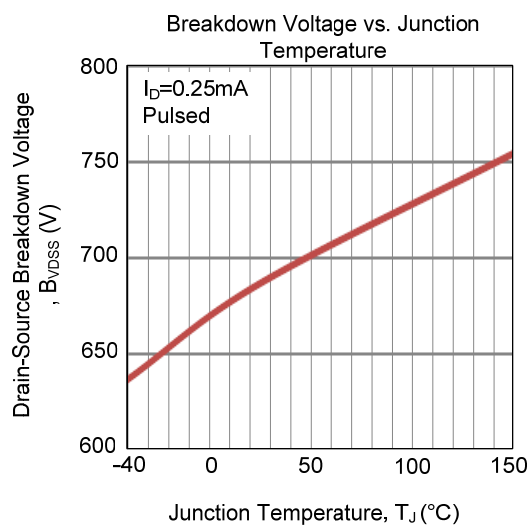
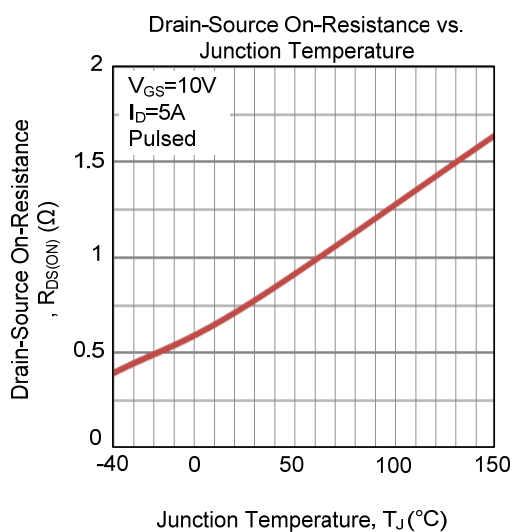
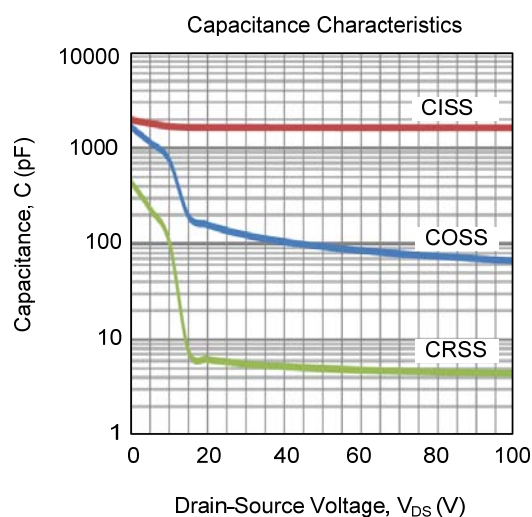
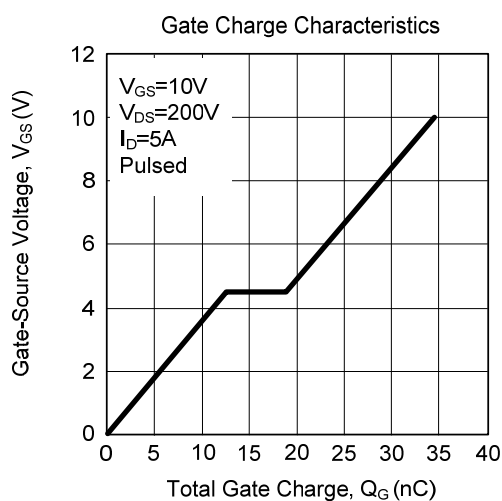
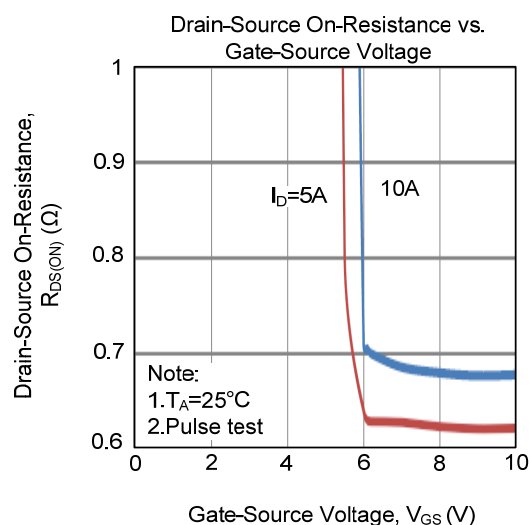
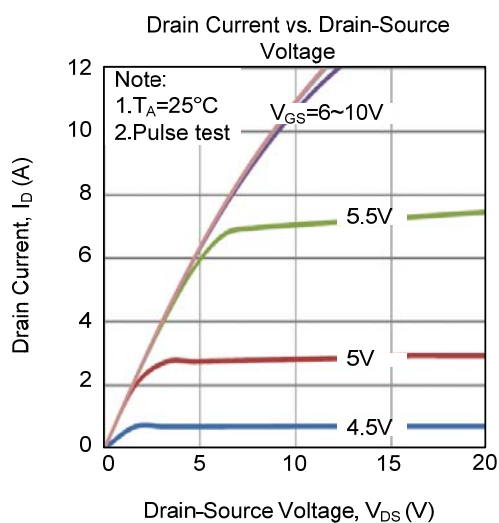


Unclamped Inductive Switching Test Circuit

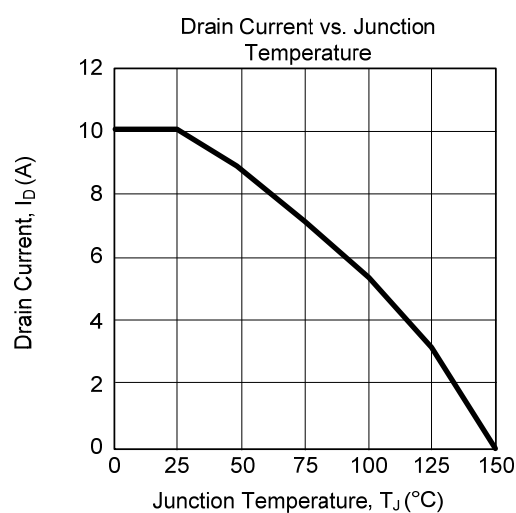
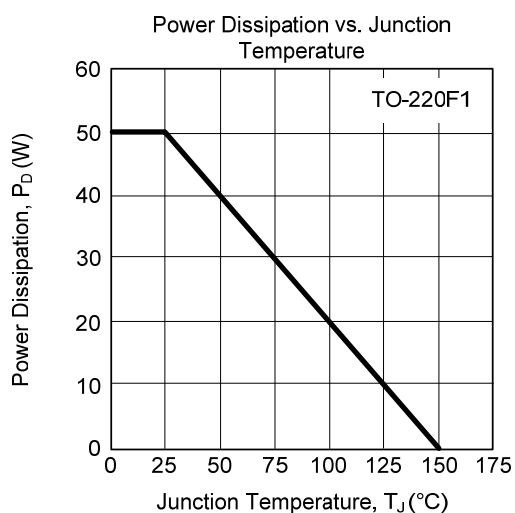
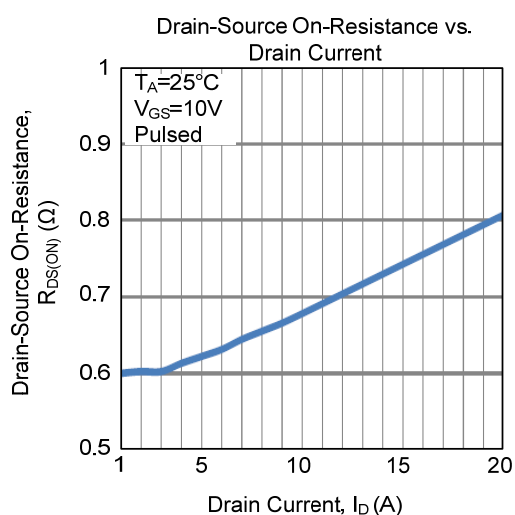
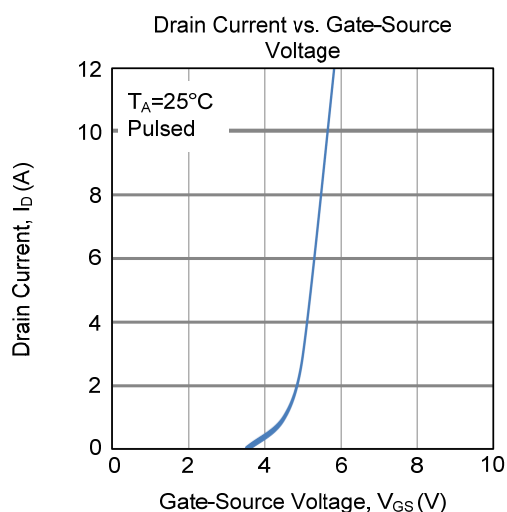
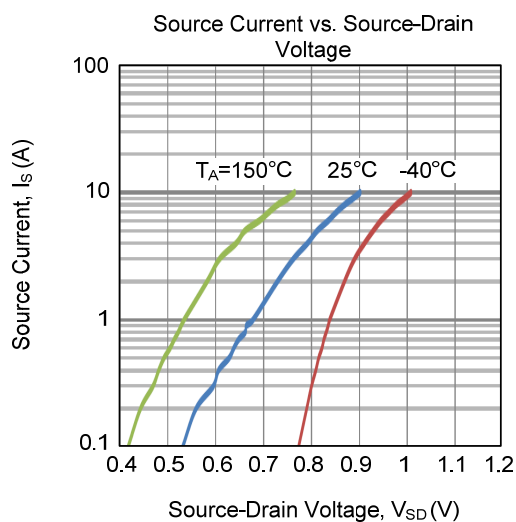
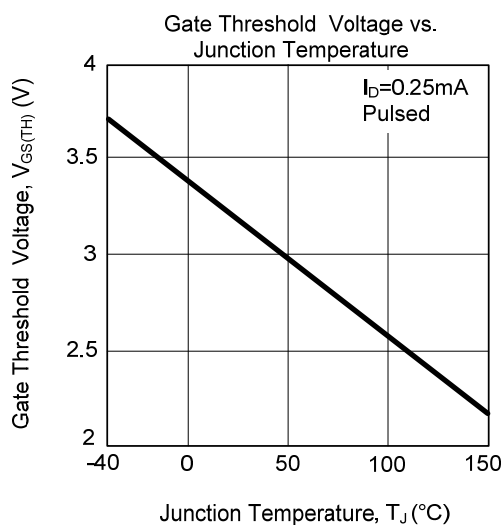


Unclamped Inductive Switching Waveforms

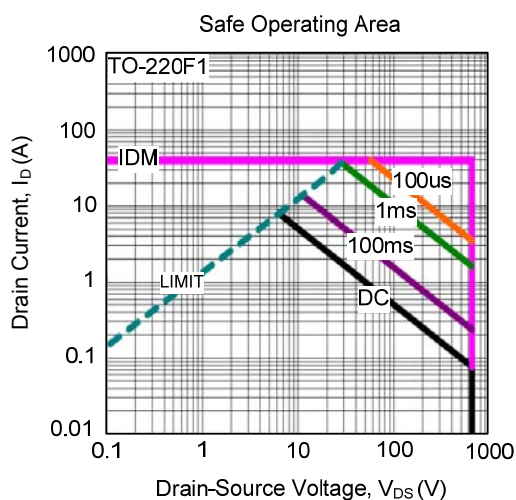
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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