



UTT75N75M

Power MOSFET

75A, 75V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

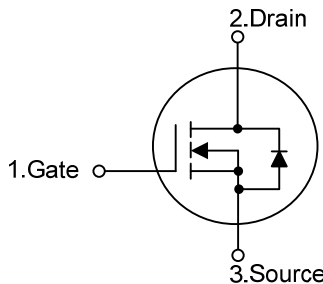
DESCRIPTION

The UTC **UTT75N75M** is N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with super low gate charge and fast switching performance. The UTC **UTT75N75M** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

FEATURES

- * $R_{DS(ON)} \leq 9.0\text{ m}\Omega$ @ $V_{GS}=10V, I_D=37.5A$
- * $R_{DS(ON)} \leq 12\text{ m}\Omega$ @ $V_{GS}=4.5V, I_D=37.5A$
- * Fast switching capability
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness

SYMBOL

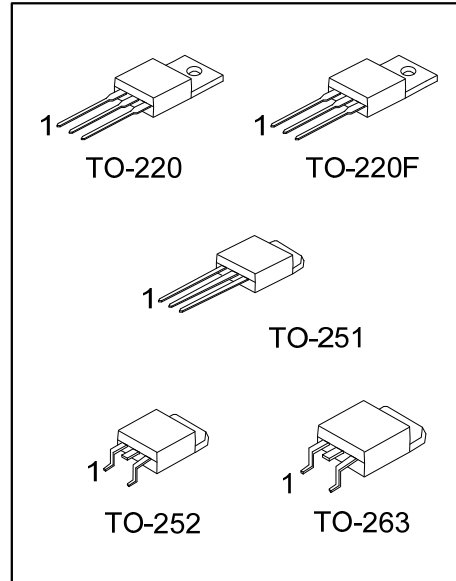


ORDERING INFORMATION

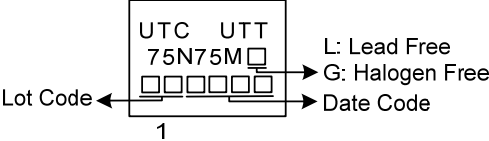
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT75N75ML-TA3-T	UTT75N75MG-TA3-T	TO-220	G	D	S	Tube
UTT75N75ML-TF3-T	UTT75N75MG-TF3-T	TO-220F	G	D	S	Tube
UTT75N75ML-TM3-T	UTT75N75MG-TM3-T	TO-251	G	D	S	Tube
UTT75N75ML-TN3-R	UTT75N75MG-TN3-R	TO-252	G	D	S	Tape Reel
UTT75N75ML-TQ2-T	UTT75N75MG-TQ2-T	TO-263	G	D	S	Tube
UTT75N75ML-TQ2-R	UTT75N75MG-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>UTT75N75MG-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251 TN3: TO-252, TQ2: TO-263</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	75	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Continuous	I_D	75	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	150	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	163	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	10.5	V/nS
Power Dissipation	TO-220/TO-263	P_D	180	W
	TO-220F		45	W
	TO-251/TO-252		64	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = 57\text{A}$, $V_{DD} = 25\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J \leq T_{JMAX}$, $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-263			
	TO-251/TO-252			
Junction to Case	TO-220/TO-263	θ_{JC}	0.69	$^\circ\text{C}/\text{W}$
	TO-220F		2.77	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		1.95	$^\circ\text{C}/\text{W}$

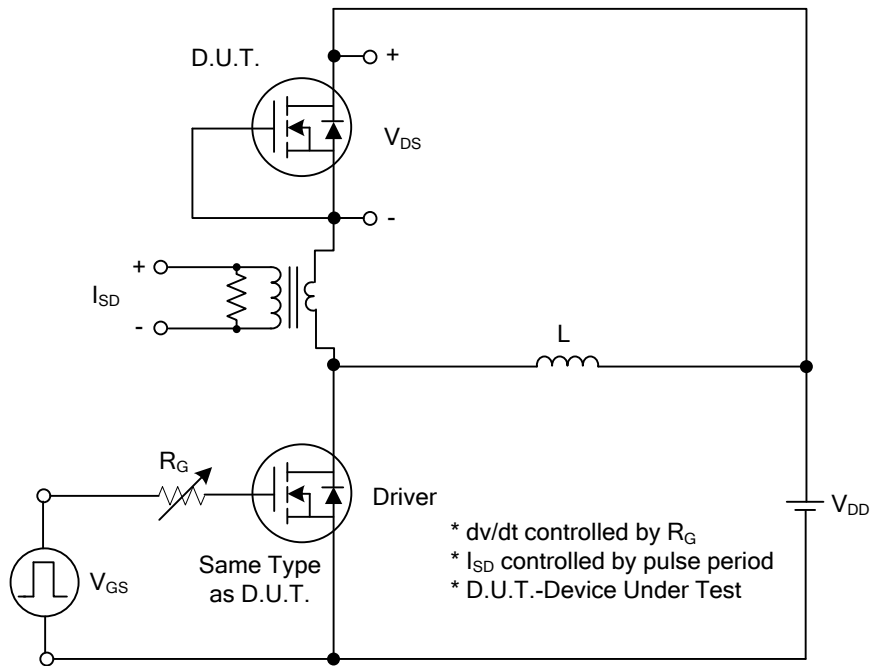
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0 V, I _D =250μA	75			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =75 V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}			100	nA
	Reverse					
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =37.5A			9.0	mΩ
		V _{GS} =4.5V, I _D =37.5A			12	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		4300		pF
Output Capacitance	C _{OSS}			310		pF
Reverse Transfer Capacitance	C _{RSS}			265		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =60V, V _{GS} =10V, I _D =75A, (Note 1, 2)		134		nC
Gate-Source Charge	Q _{GS}			20		nC
Gate-Drain Charge	Q _{GD}			43		nC
Turn-On Delay Time (Note 1)	t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =75A, R _G =3.3Ω (Note 1, 2)		15		ns
Turn-On Rise Time	t _R			20		ns
Turn-Off Delay Time	t _{D(OFF)}			70		ns
Turn-Off Fall Time	t _F			26		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Source Current	I _S				75	A
Pulsed Source Current	I _{SM}				150	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =75A, V _{GS} =0V			1.5	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =30A, V _{GS} =0V, dI _F /dt=100A/μs		42		nS
Body Diode Reverse Recovery Charge	Q _{rr}				43	

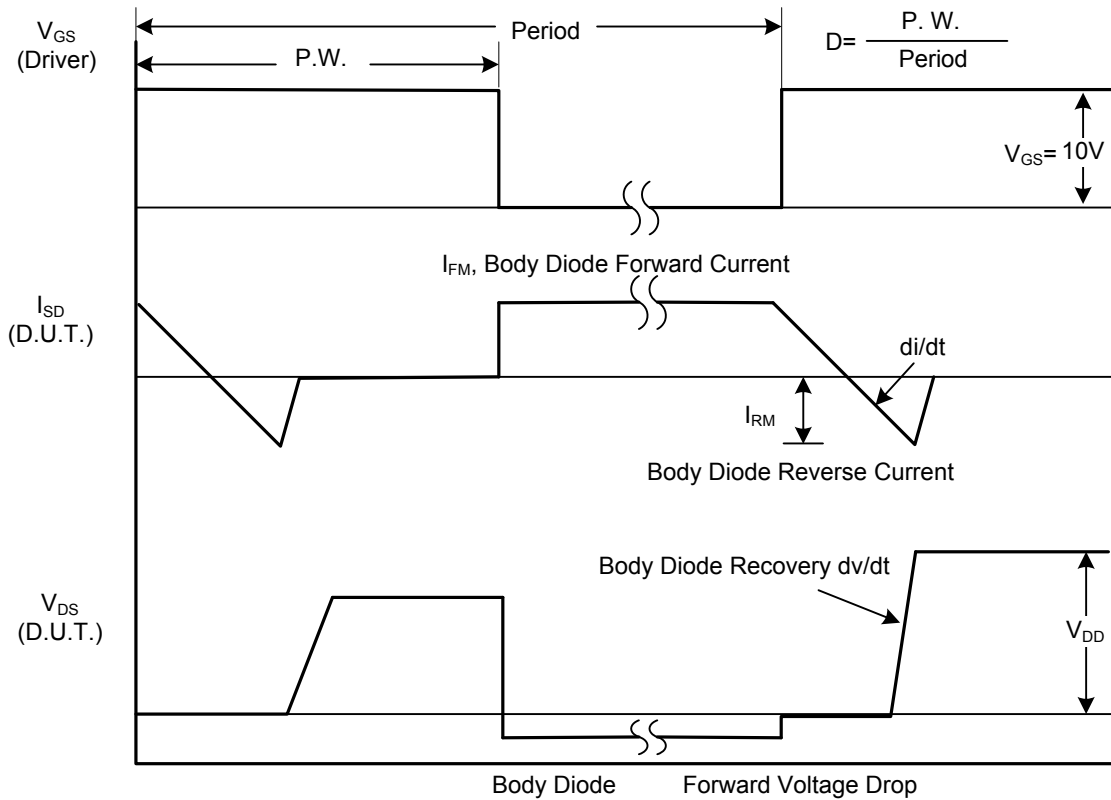
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

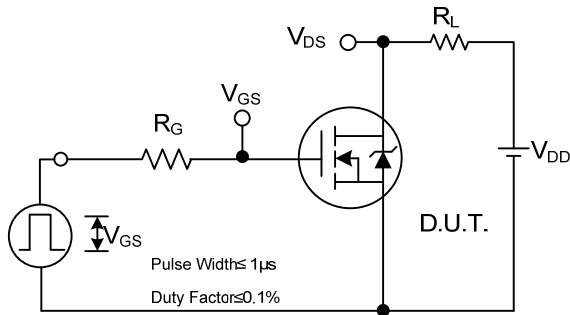


Peak Diode Recovery dv/dt Test Circuit

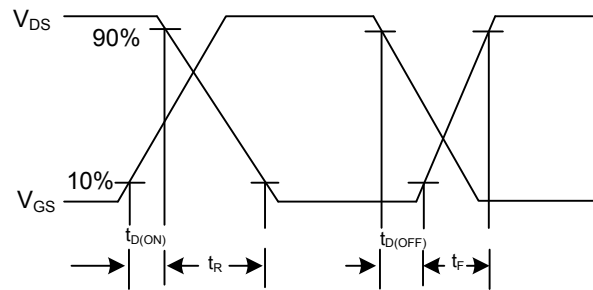


Peak Diode Recovery dv/dt Waveforms

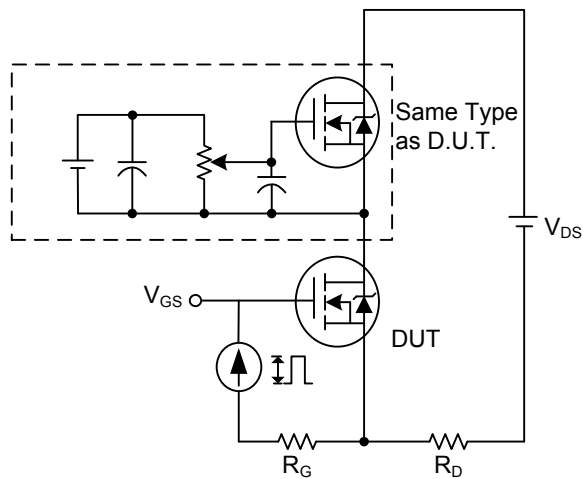
TEST CIRCUITS AND WAVEFORMS



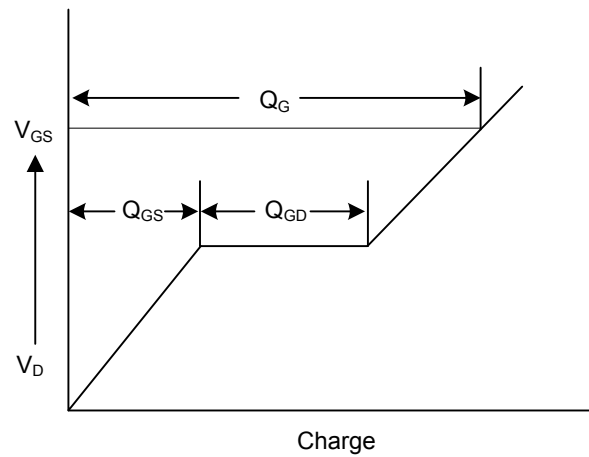
Switching Test Circuit



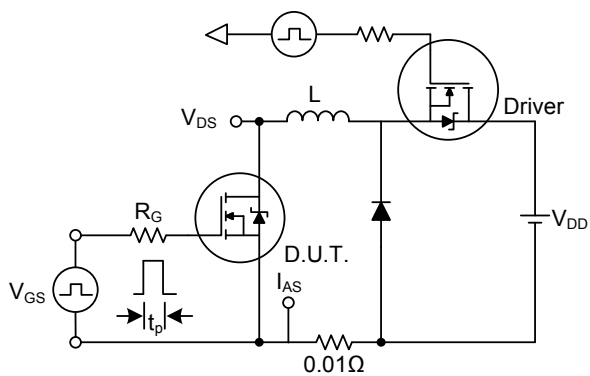
Switching Waveforms



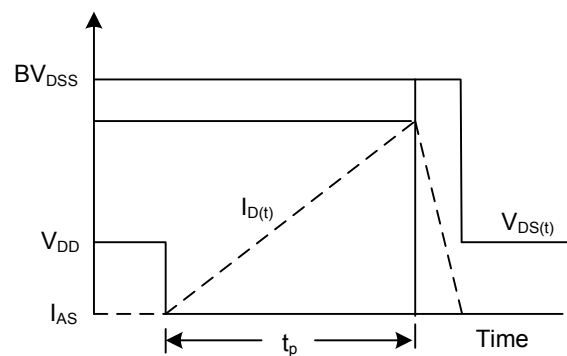
Gate Charge Test Circuit



Gate Charge Waveform

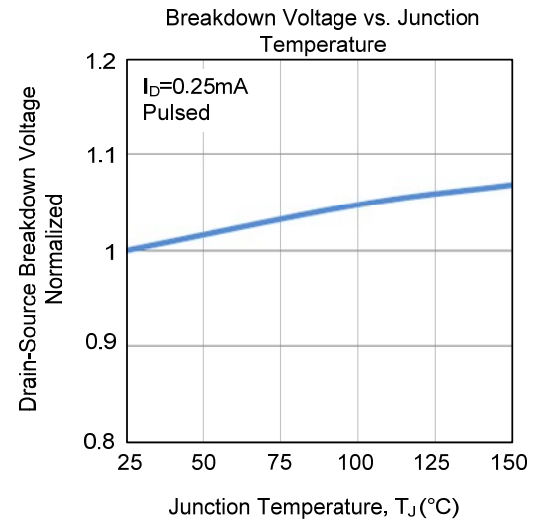
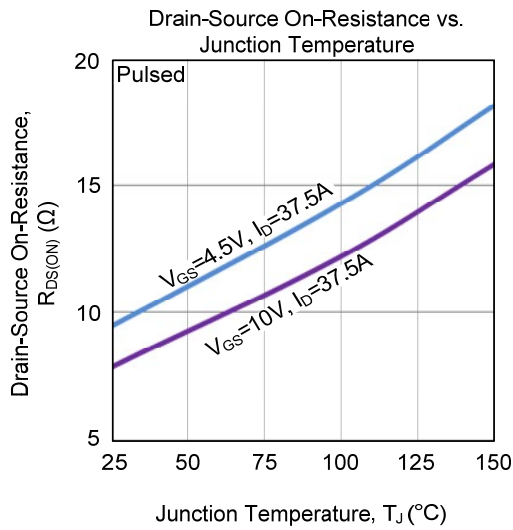
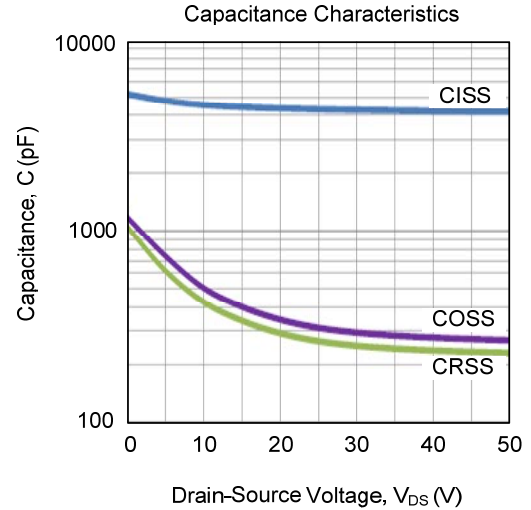
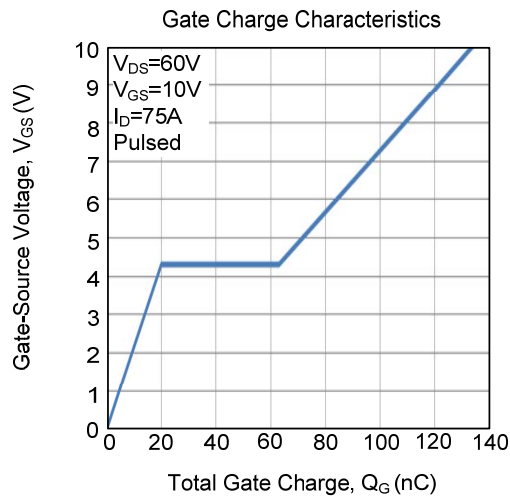
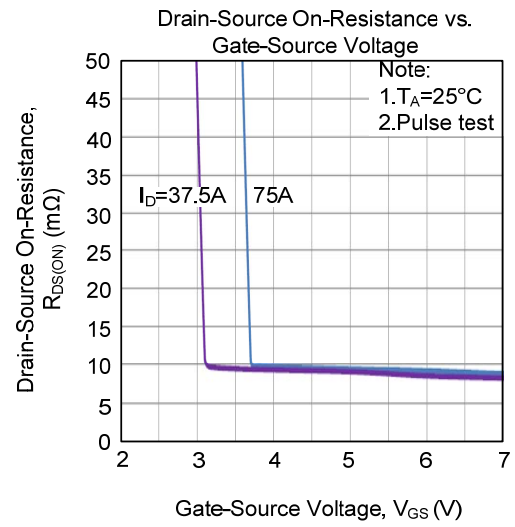
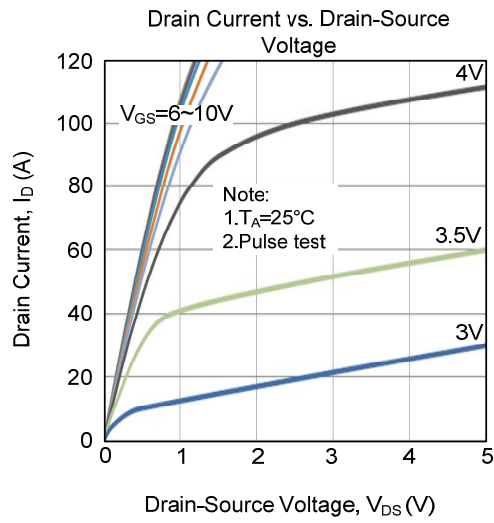


Unclamped Inductive Switching Test Circuit

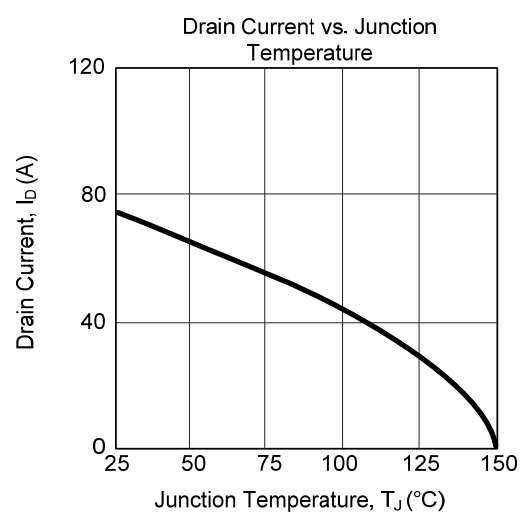
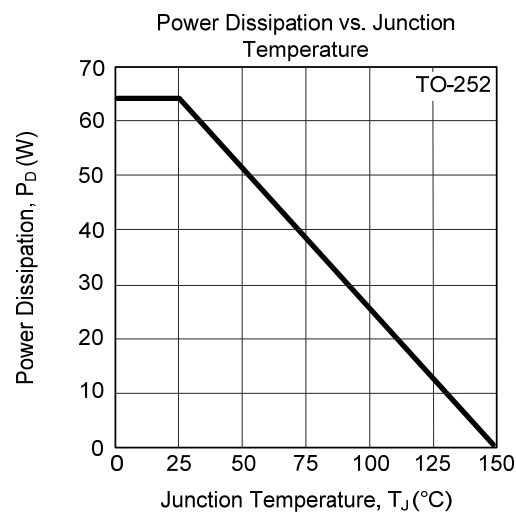
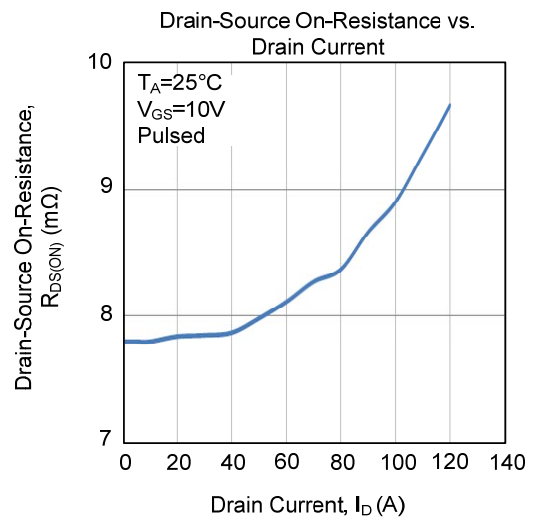
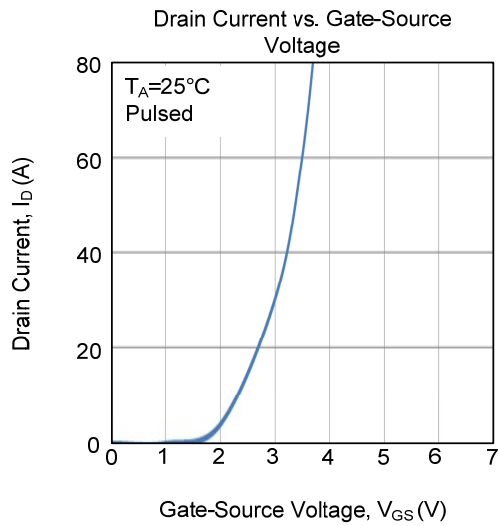
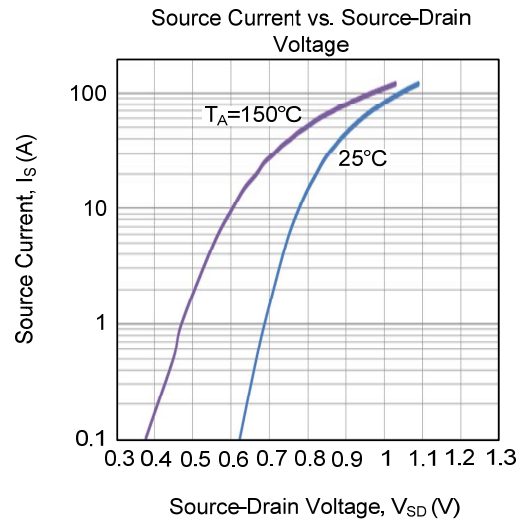
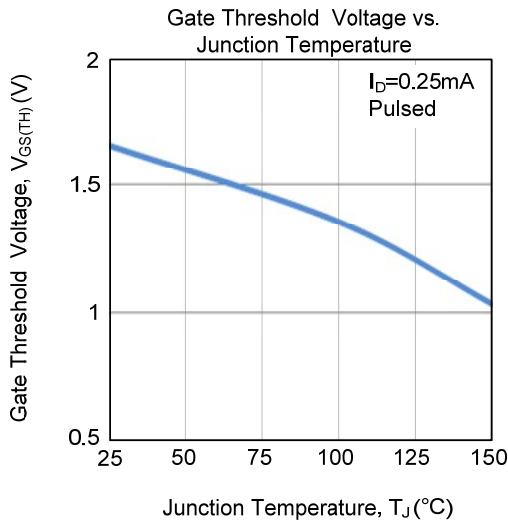


Unclamped Inductive Switching Waveforms

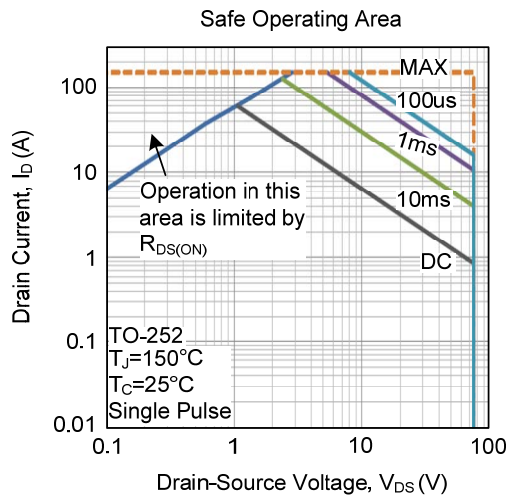
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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