



25N10

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

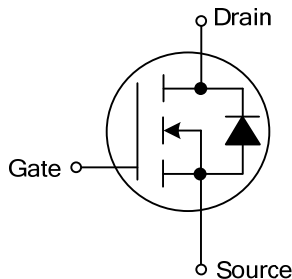
The UTC **25N10** is an N-channel enhancement mode power MOSFET and it uses UTC's perfect technology to provide designers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

It is generally suitable for all commercial-industrial applications and DC/DC converters requiring low voltage.

FEATURES

- * Single Drive Requirement
- * Low Gate Charge
- * RoHS Compliant

SYMBOL

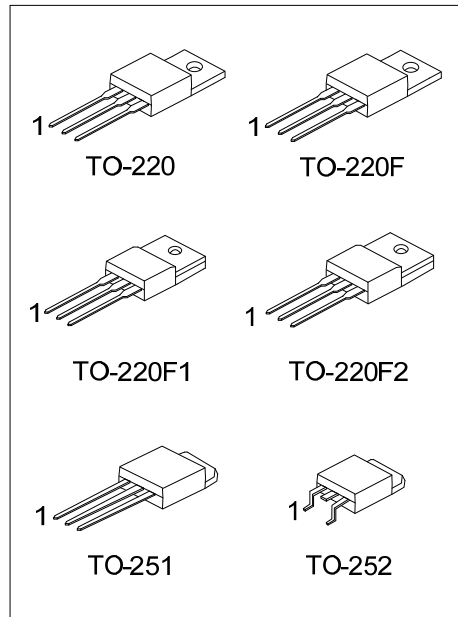


ORDERING INFORMATION

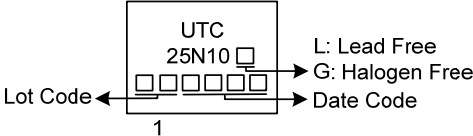
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
25N10L-TA3-T	25N10G-TA3-T	TO-220	G	D	S	Tube
25N10L-TF1-T	25N10G-TF1-T	TO-220F1	G	D	S	Tube
25N10L-TF2-T	25N10G-TF2-T	TO-220F2	G	D	S	Tube
25N10L-TF3-T	25N10G-TF3-T	TO-220F	G	D	S	Tube
25N10L-TM3-T	25N10G-TM3-T	TO-251	G	D	S	Tube
25N10L-TN3-R	25N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>25N10G-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, TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TM3: TO-251, TN3: TO-252</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}	100	V
Gate Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current ($V_{GS}=10\text{V}$)	$T_C=25^\circ\text{C}$	I_D	23	A
	$T_C=100^\circ\text{C}$	I_D	14.6	A
Pulsed Drain Current (Note 2)		I_{DM}	80	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	480	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.58	V/ns
Power Dissipation	TO-220	P_D	125	W
	TO-220F/TO-220F1		41	
	TO-220F2			
	TO-251/TO-252		50	
Operating Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature		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. $L=10\text{mH}$, $I_{AS}=9.8\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-220F1/TO-220F2			
	TO-251/TO-252			
Junction to Case	TO-220	θ_{JC}	1	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		3.04	
	TO-220F2			
	TO-251/TO-252		2.5 (Note)	

Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

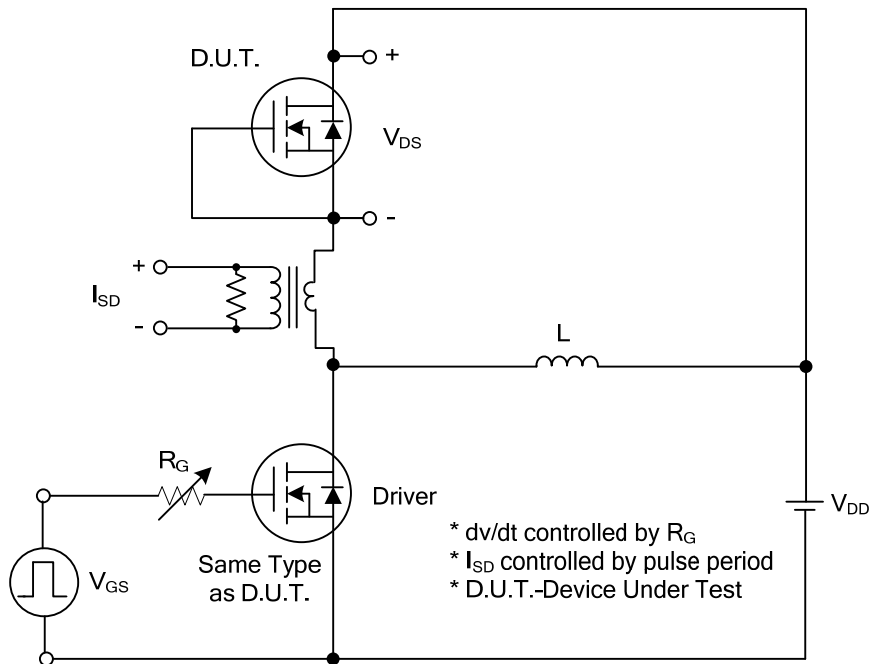
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 1mA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V, T _J = 25°C			25	μA
		V _{DS} = 80V, V _{GS} = 0V, T _J = 150°C			100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = ±20V			±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-Resistance (Note)	R _{DS(ON)}	V _{GS} = 10V, I _D = 16A			80	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz		762		pF
Output Capacitance	C _{OSS}			196		pF
Reverse Transfer Capacitance	C _{RSS}			22		pF
Gate Resistance	R _G	f = 1.0MHz		1.5	2.3	Ω
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q _G	V _{GS} = 10V, V _{DS} = 100V, I _D = 25A		28.5		nC
Gate Source Charge	Q _{GS}			6.0		nC
Gate Drain Charge	Q _{GD}			7.5		nC
Turn-ON Delay Time ¹	t _{D(ON)}	V _{DD} = 100V, I _D = 25A, R _G = 25Ω, V _{GS} = 10V, R _D = 4.0Ω		16		ns
Turn-ON Rise Time	t _R			26		ns
Turn-OFF Delay Time	t _{D(OFF)}			34		ns
Turn-OFF Fall-Time	t _F			19		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				25	A
Maximum Body-Diode Pulsed Current	I _{SM}				50	A
Drain-Source Diode Forward Voltage (Note)	V _{SD}	I _S = 25A, V _{GS} = 0V			1.3	V
Reverse Recovery Time	t _{rr}	I _S = 25A, V _{GS} = 0V, dI/dt = 100A/μs		96		ns
Reverse Recovery Charge	Q _{rr}			342		nC

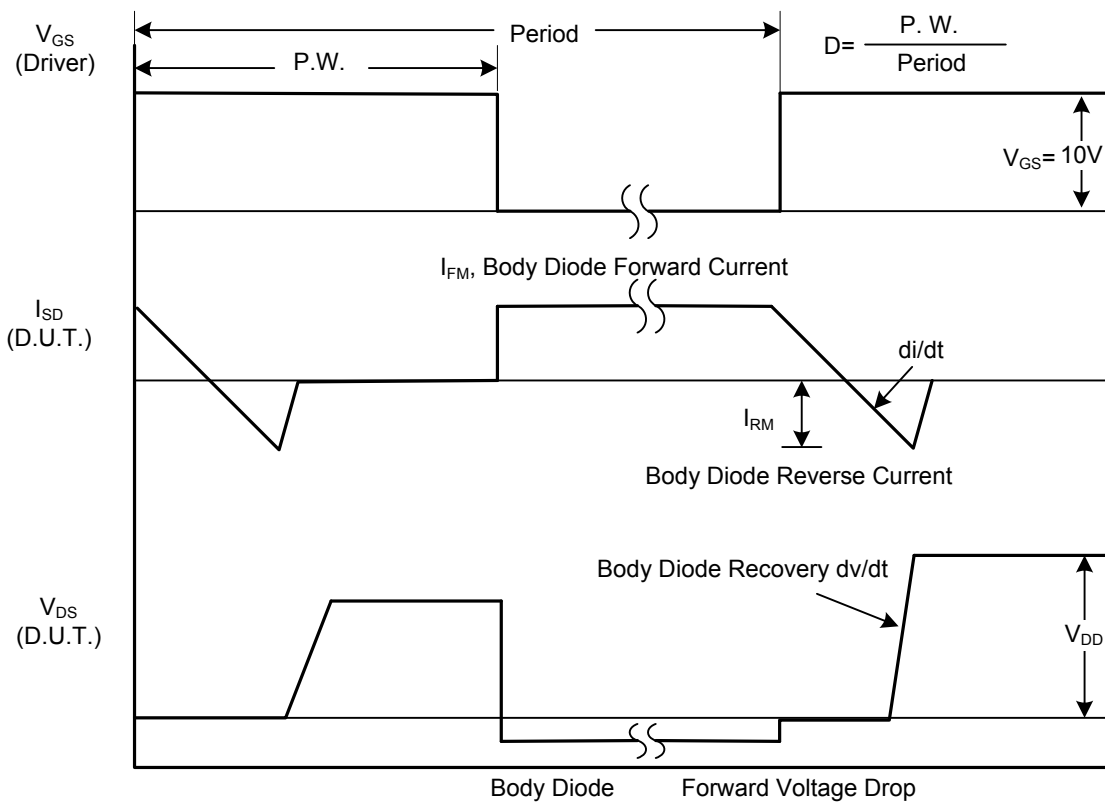
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

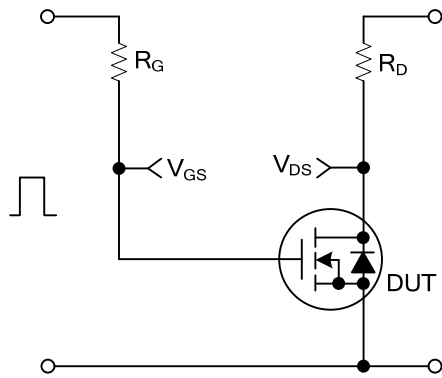


Peak Diode Recovery dv/dt Test Circuit

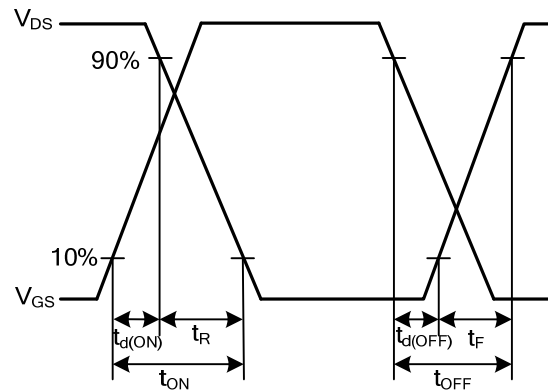


Peak Diode Recovery dv/dt Waveforms

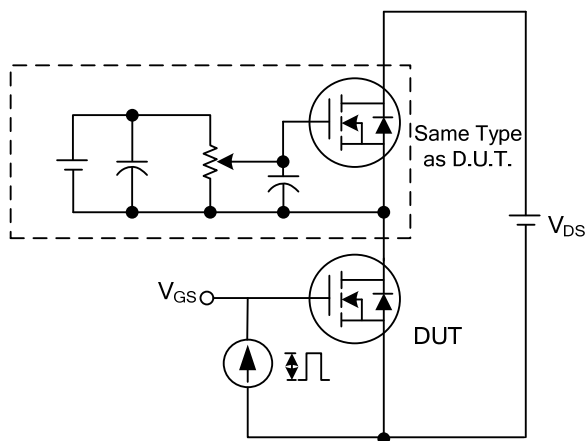
TEST CIRCUITS AND WAVEFORMS



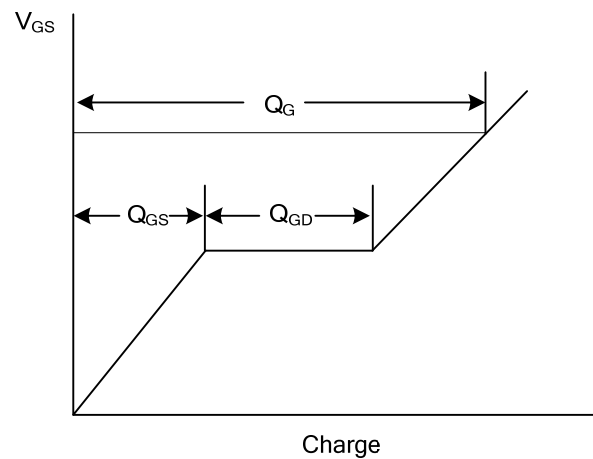
Switching Test Circuit



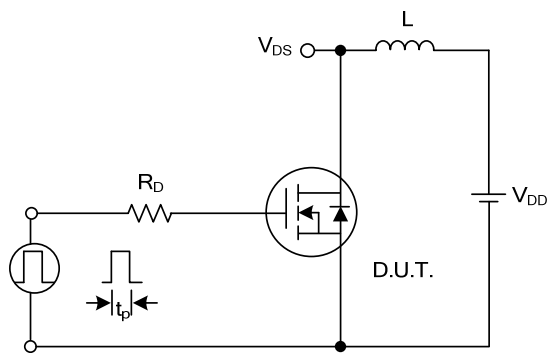
Switching Waveforms



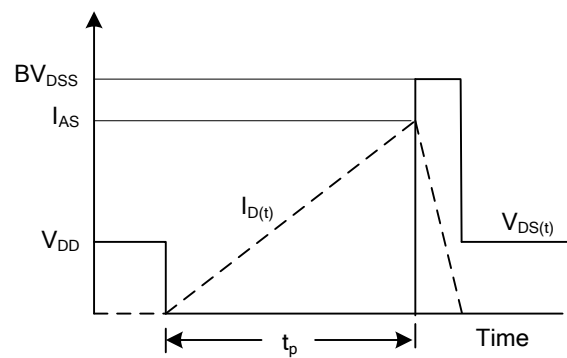
Gate Charge Test Circuit



Gate Charge Waveform

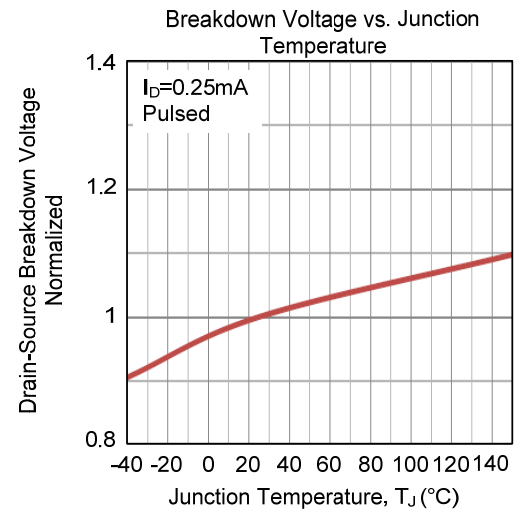
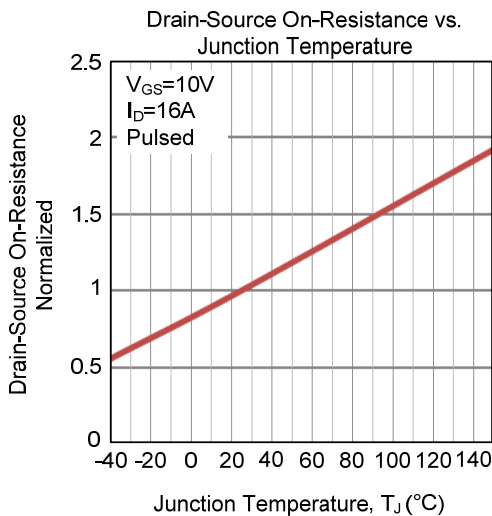
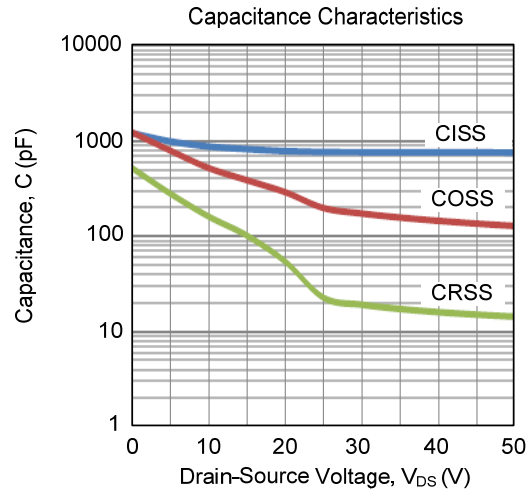
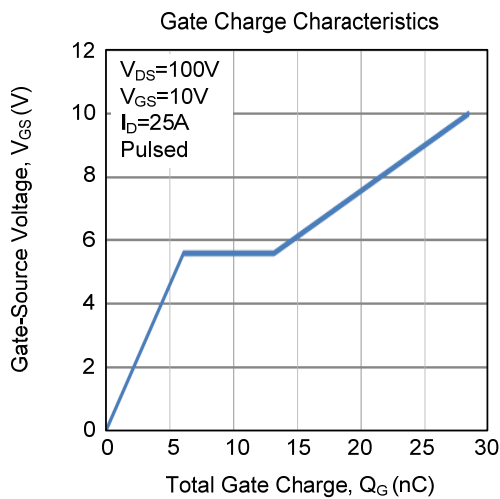
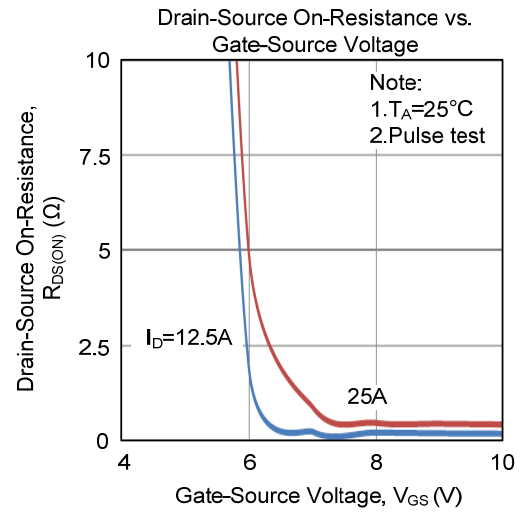
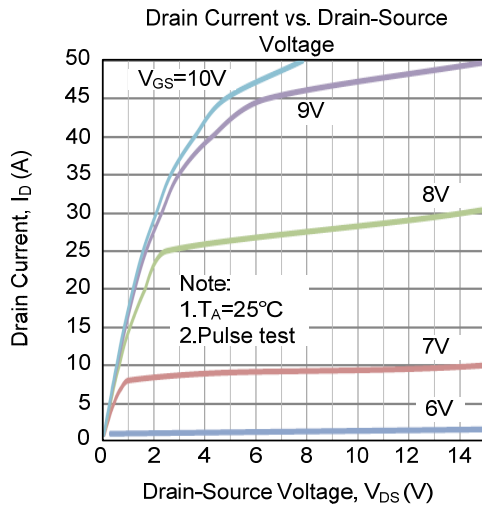


Unclamped Inductive Switching Test Circuit

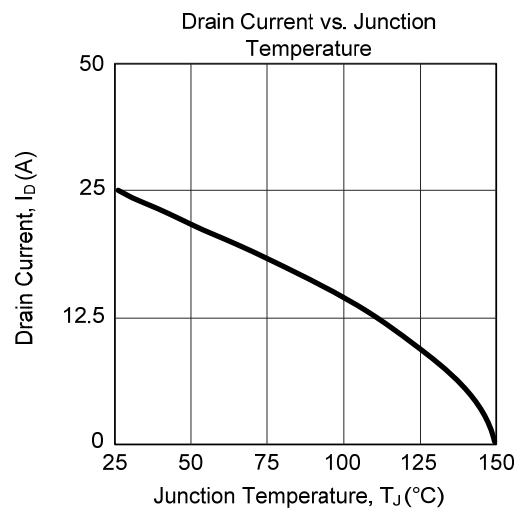
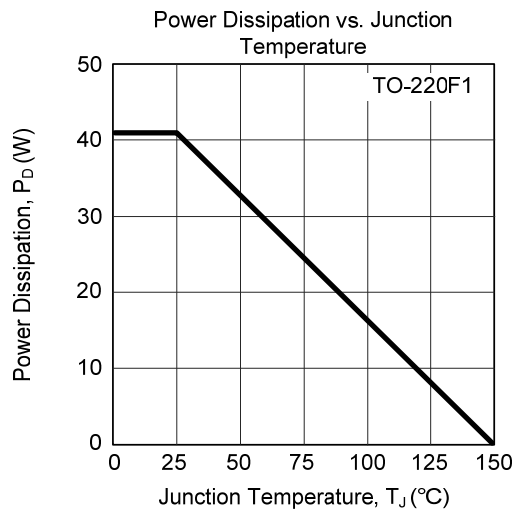
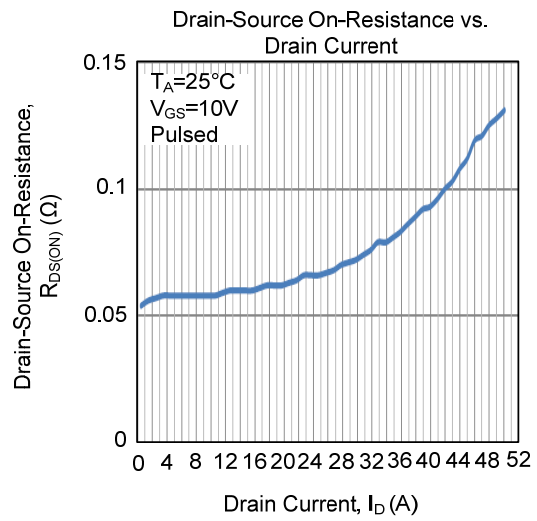
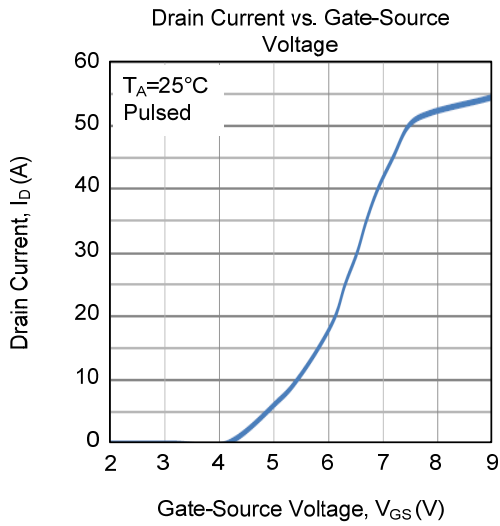
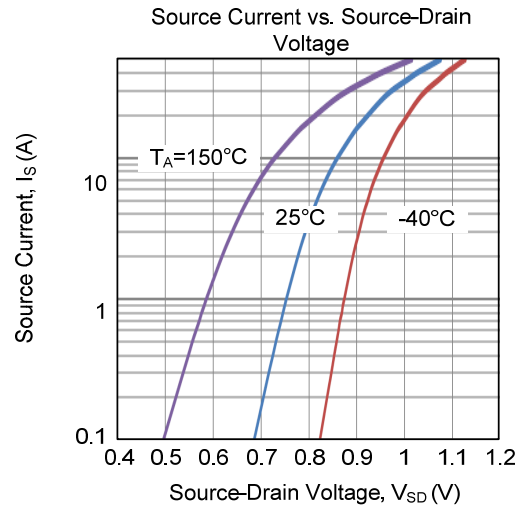
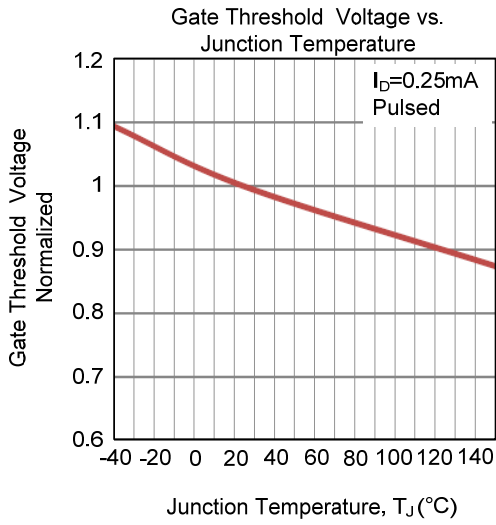


Unclamped Inductive Switching Waveforms

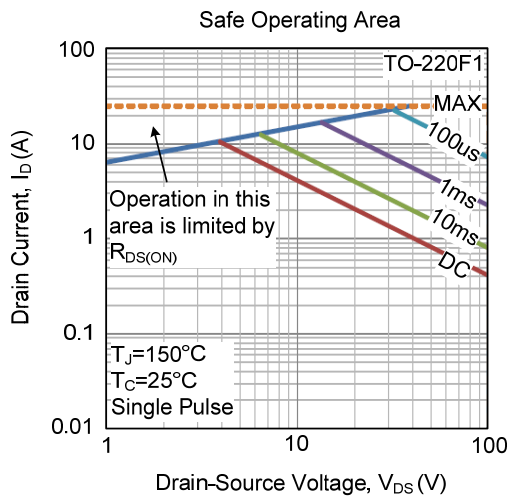
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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