

**15N25****Power MOSFET****15A, 250V N-CHANNEL
POWER MOSFET****DESCRIPTION**

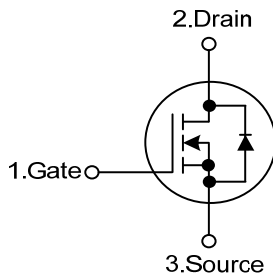
The UTC **15N25** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **15N25** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

FEATURES

* $R_{DS(ON)} \leq 0.32 \Omega$ @ $V_{GS}=10V$, $I_D=7.5A$

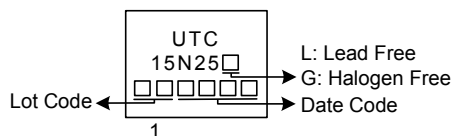
* High Switching Speed

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N25L-TA3-T	15N25G-TA3-T	TO-220	G	D	S	Tube
15N25L-TF1-T	15N25G-TF1-T	TO-220F1	G	D	S	Tube
15N25L-TF3-T	15N25G-TF3-T	TO-220F	G	D	S	Tube
15N25L-TN3-R	15N25G-TN3-R	TO-252	G	D	S	Tape Reel

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

15N25G-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	250	V
Gate-Source Voltage		V_{GS}	± 30	V
Continuous Drain Current	Continuous	I_D	15	A
	Pulsed	I_{DM}	30	A
Single Pulsed Avalanche Current		I_{AS}	15	A
Single Pulsed Avalanche Energy		E_{AS}	186	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	6.4	V/ns
Power Dissipation	TO-220	P_D	104	W
	TO-220F		40	W
	TO-220F1			
	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. $L=1.58\text{mH}$, $I_{AS}=15\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD}\leq 15\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

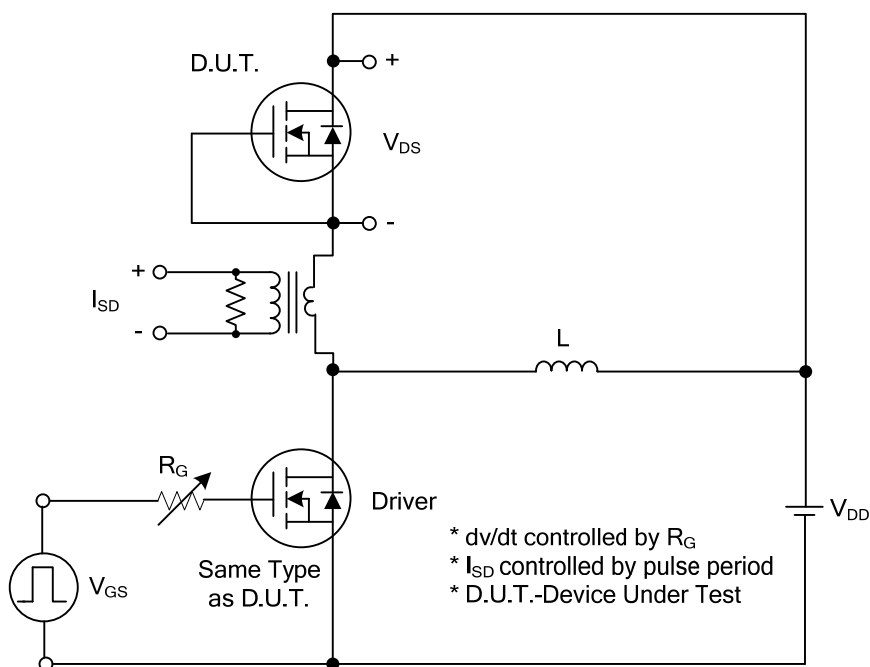
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-220F			
	TO-220F1		110	°C/W
	TO-252			
Junction to Case	TO-220	θ_{JC}	1.2	°C/W
	TO-220F		3.125	°C/W
	TO-220F1			
	TO-252		2.23	°C/W

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

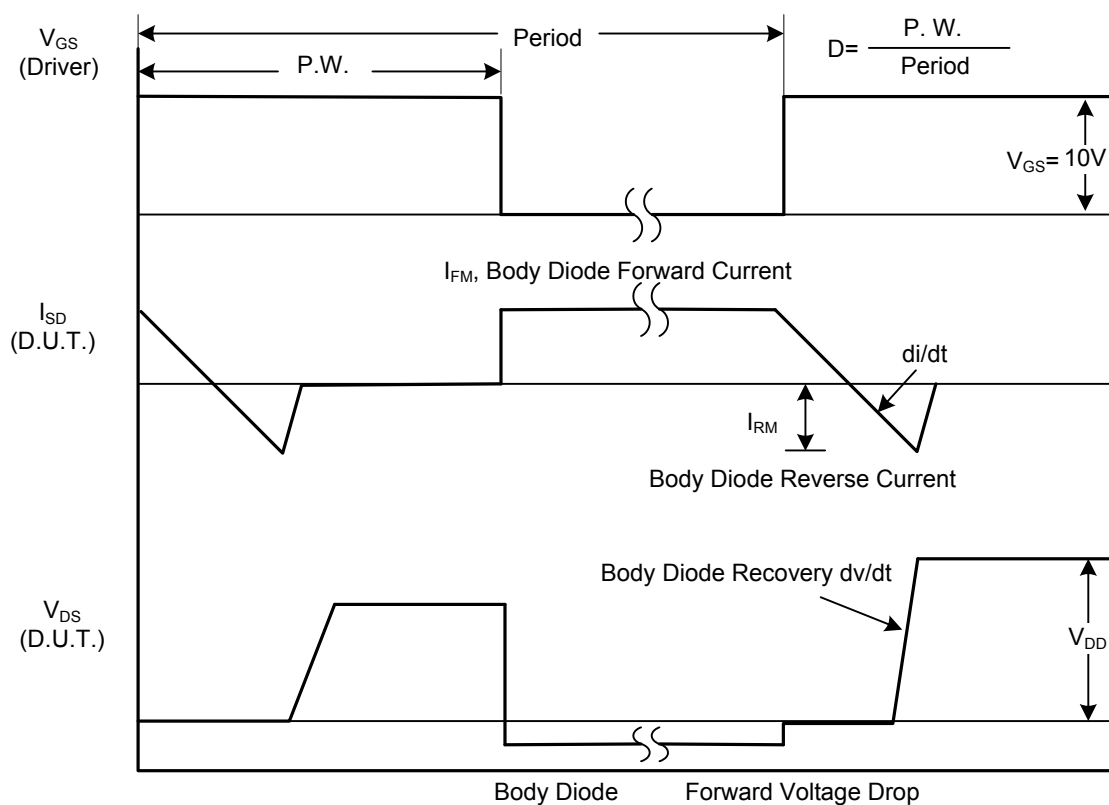
ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	250			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =250V, 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 =7.5A			0.32	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		700		pF
Output Capacitance		C _{OSS}			125		pF
Reverse Transfer Capacitance		C _{RSS}			18		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =200V, V _{GS} =10V, I _D =15A I _G =1mA (Note 1, 2)		25		nC
Gate to Source Charge		Q _{GS}			8.6		nC
Gate to Drain Charge		Q _{GD}			7.6		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =100V, I _D =15A, R _G =25Ω (Note 1, 2)		10		ns
Rise Time		t _R			19		ns
Turn-OFF Delay Time		t _{D(OFF)}			55		ns
Fall-Time		t _F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				15	A
Maximum Body-Diode Pulsed Current		I _{SM}				30	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =15A, V _{GS} =0V			1.5	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =15A, V _{GS} =0V, dI _F /dt=100A/μs		190		ns
Reverse Recovery Charge		Q _{rr}	(Note 1)		2.8		μC

TEST CIRCUITS AND WAVEFORMS

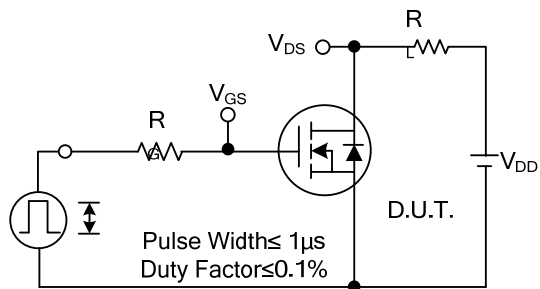


Peak Diode Recovery dv/dt Test Circuit

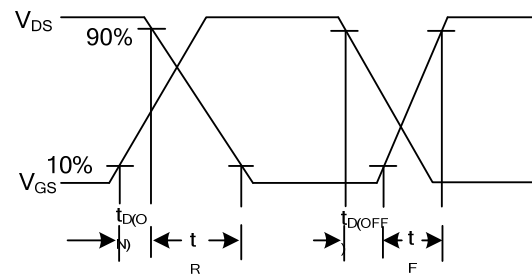


Peak Diode Recovery dv/dt Waveforms

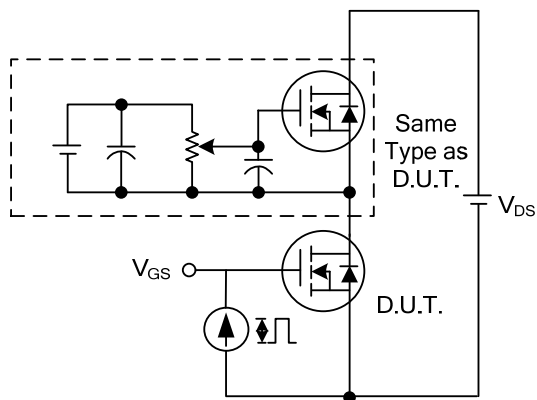
■ TEST CIRCUITS AND WAVEFORMS



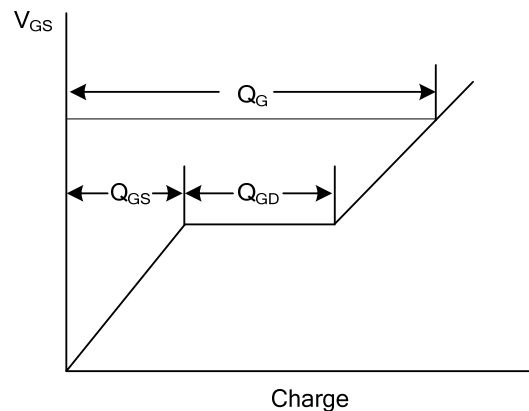
Switching Test Circuit



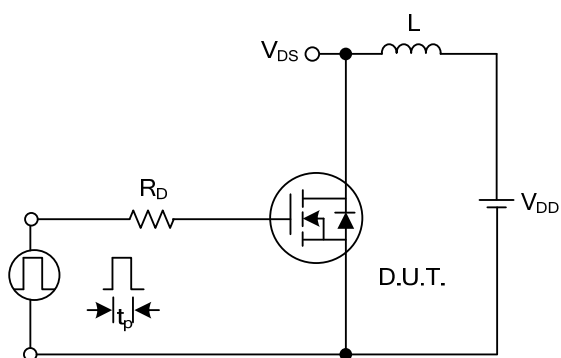
Switching Waveforms



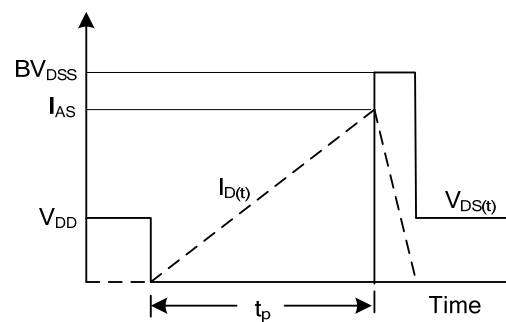
Gate Charge Test Circuit



Gate Charge Waveform

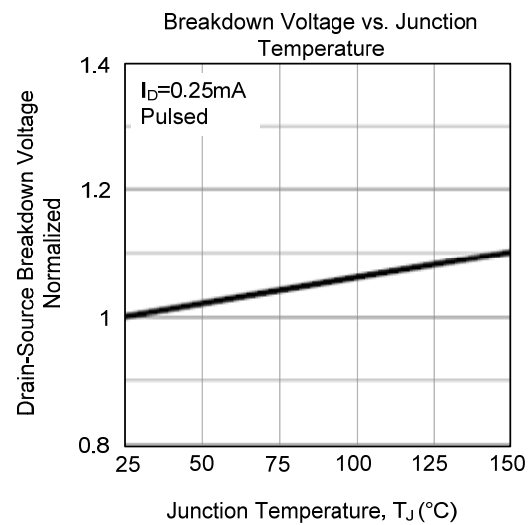
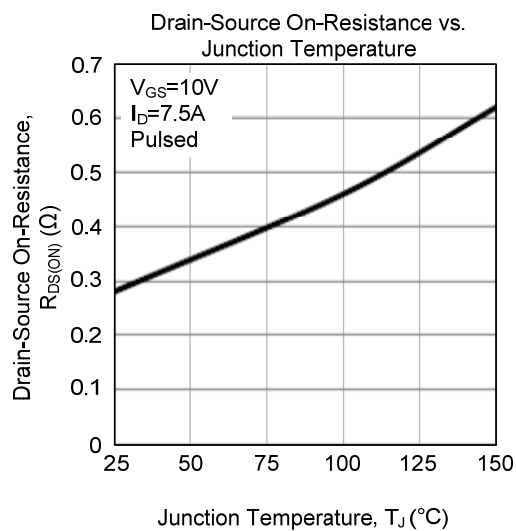
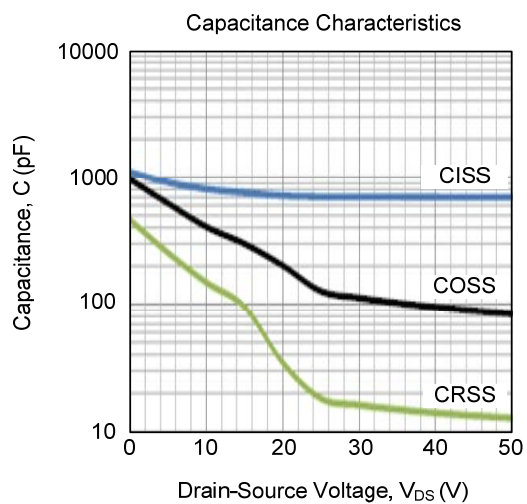
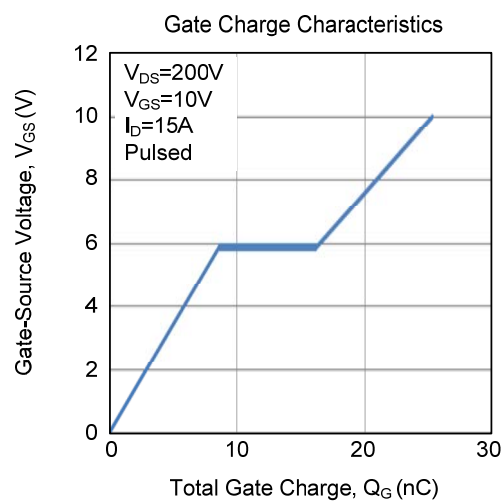
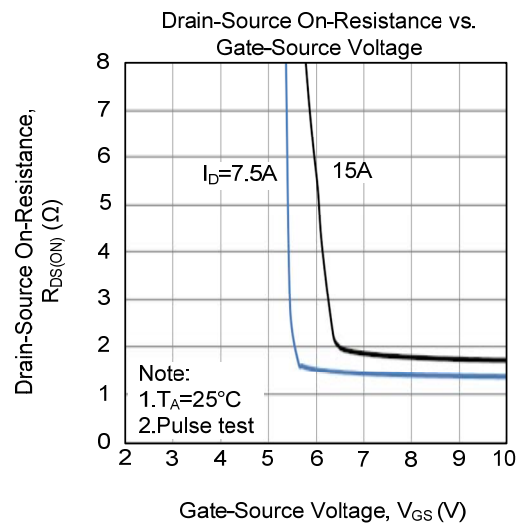
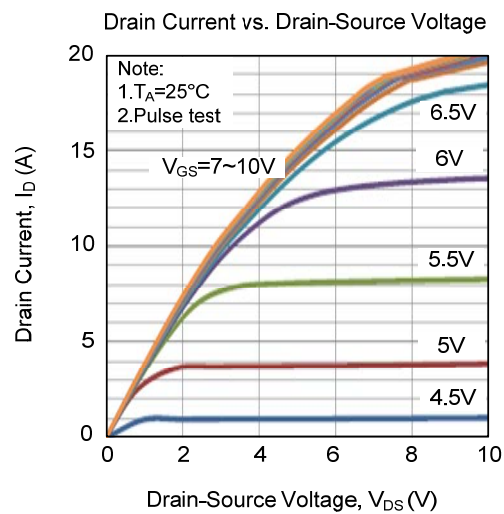


Unclamped Inductive Switching Test Circuit

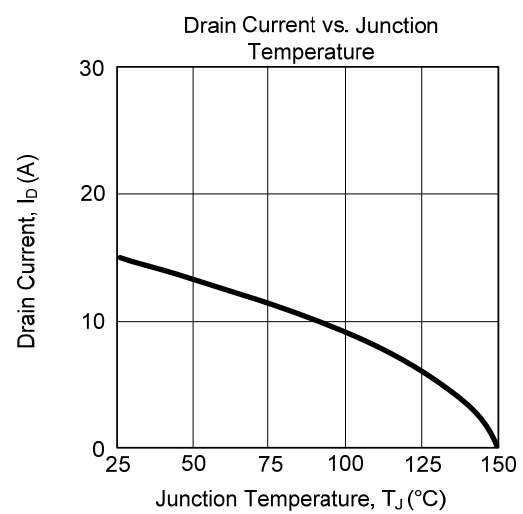
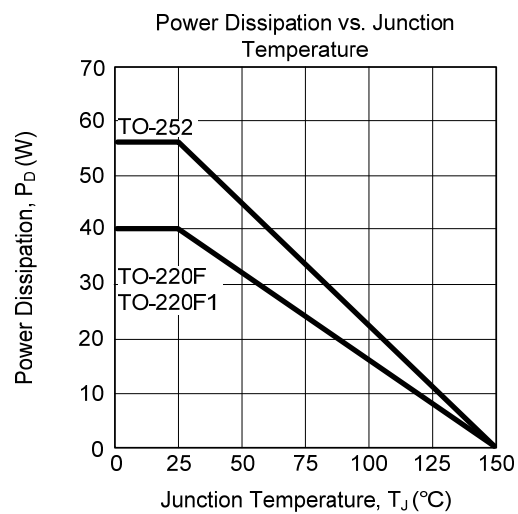
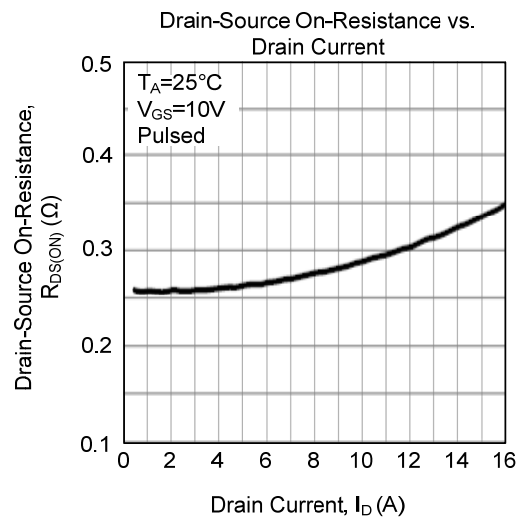
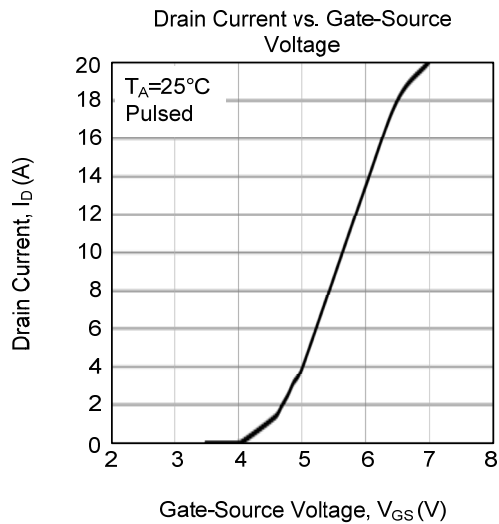
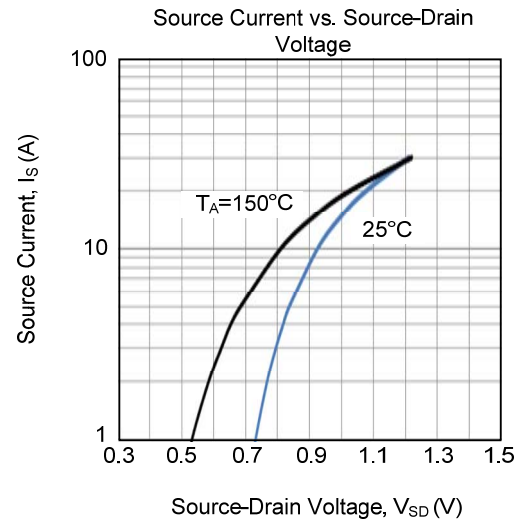
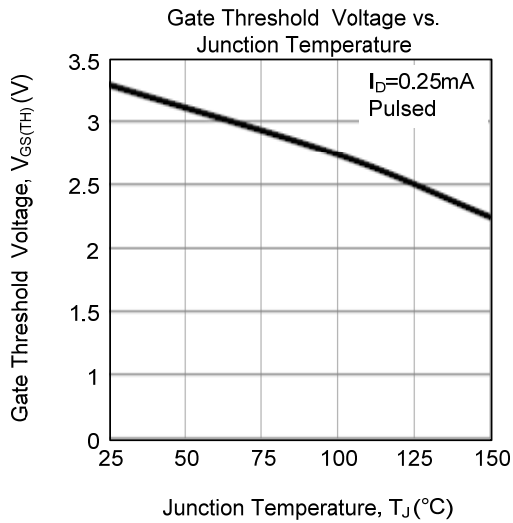


Unclamped Inductive Switching Waveforms

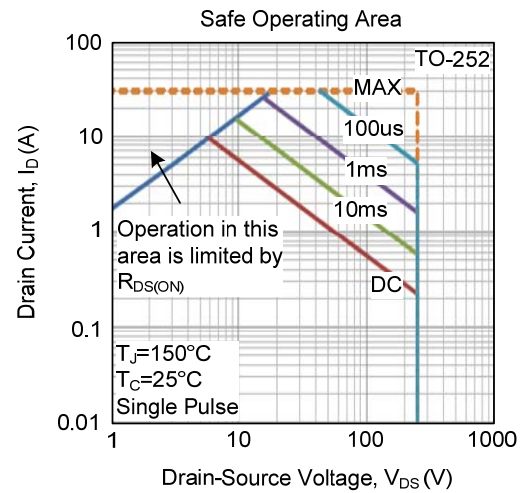
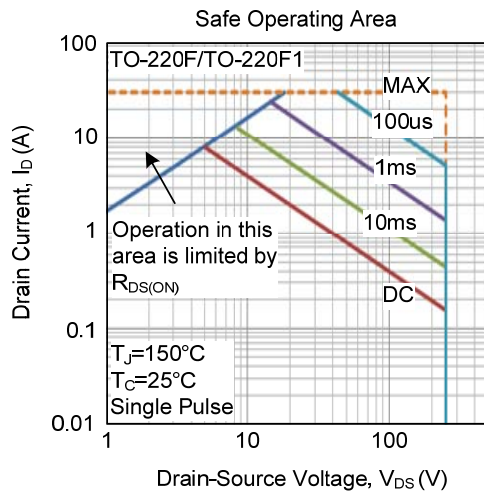
■ TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



TYPICAL CHARACTERISTICS (Cont.)



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