

**90N25-HC****Power MOSFET****90A, 250V N-CHANNEL
POWER MOSFET****DESCRIPTION**

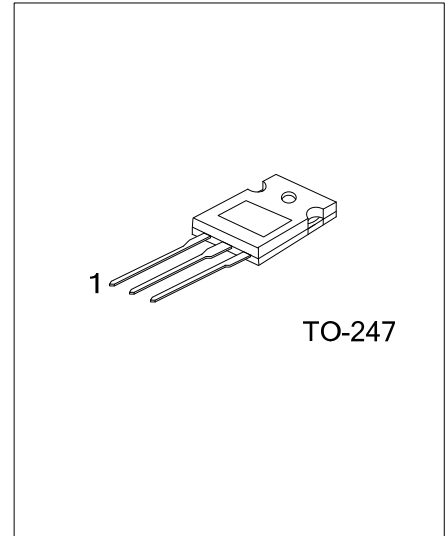
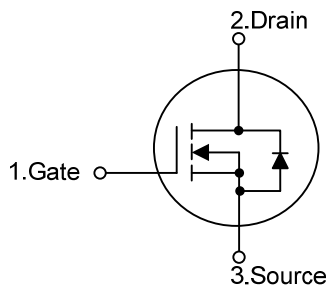
The UTC **90N25-HC** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **90N25-HC** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

FEATURES

* $R_{DS(ON)} \leq 32 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=45\text{A}$

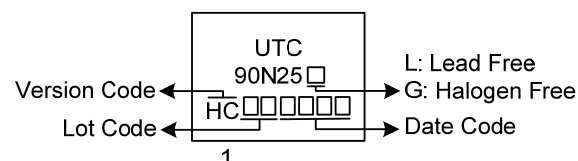
* High Switching Speed

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
90N25L-T47-T	90N25G-T47-T	TO-247	G	D	S	Tube

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

90N25G-T47-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) T47: TO-247 (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}	± 20	V
Continuous Drain Current	Continuous	I_D	90
	Pulsed	I_{DM}	180
Single Pulsed Avalanche Energy	E_{AS}	500	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	12.65	V/ns
Power Dissipation	P_D	320	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. $L = 0.1\text{mH}$, $I_{AS} = 100\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	50	°C/W
Junction to Case	θ_{JC}	0.39	°C/W

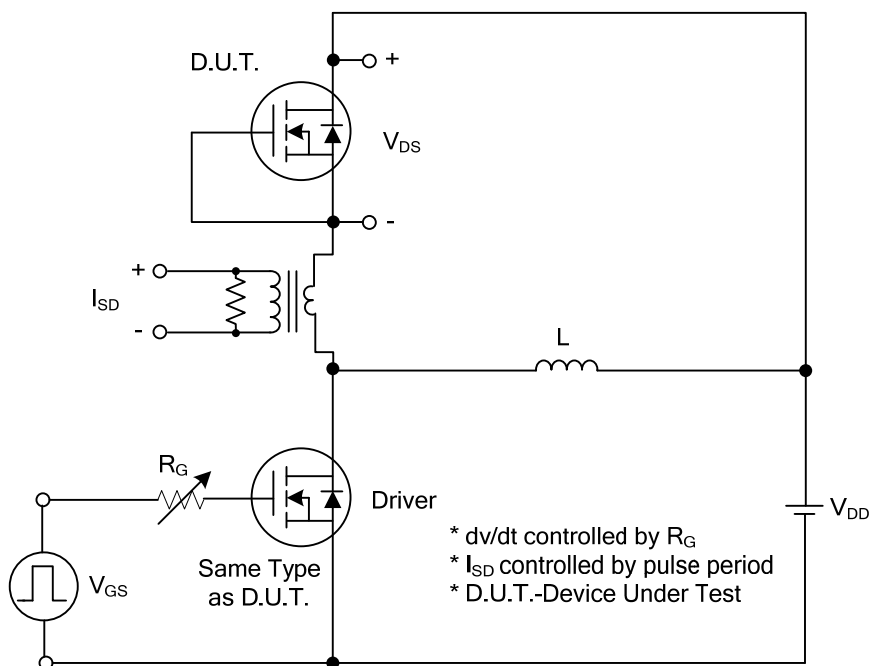
■ ELECTRICAL CHARACTERISTICS

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			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, 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 =45A			32	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		7814		pF
Output Capacitance		C _{OSS}			1180		pF
Reverse Transfer Capacitance		C _{RSS}			40		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =200V, V _{GS} =10V, I _D =90A (Note 1, 2)		200		nC
Gate to Source Charge		Q _{GS}			53		nC
Gate to Drain Charge		Q _{GD}			61		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =90A, R _G =3Ω (Note 1, 2)		30		ns
Rise Time		t _R			21.5		ns
Turn-OFF Delay Time		t _{D(OFF)}			82.8		ns
Fall-Time		t _F			19.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				90	A
Maximum Body-Diode Pulsed Current		I _{SM}				180	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =90A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V, dI _F /dt=100A/μs		292		ns
Reverse Recovery Charge		Q _{rr}	(Note 1)		2.95		μC

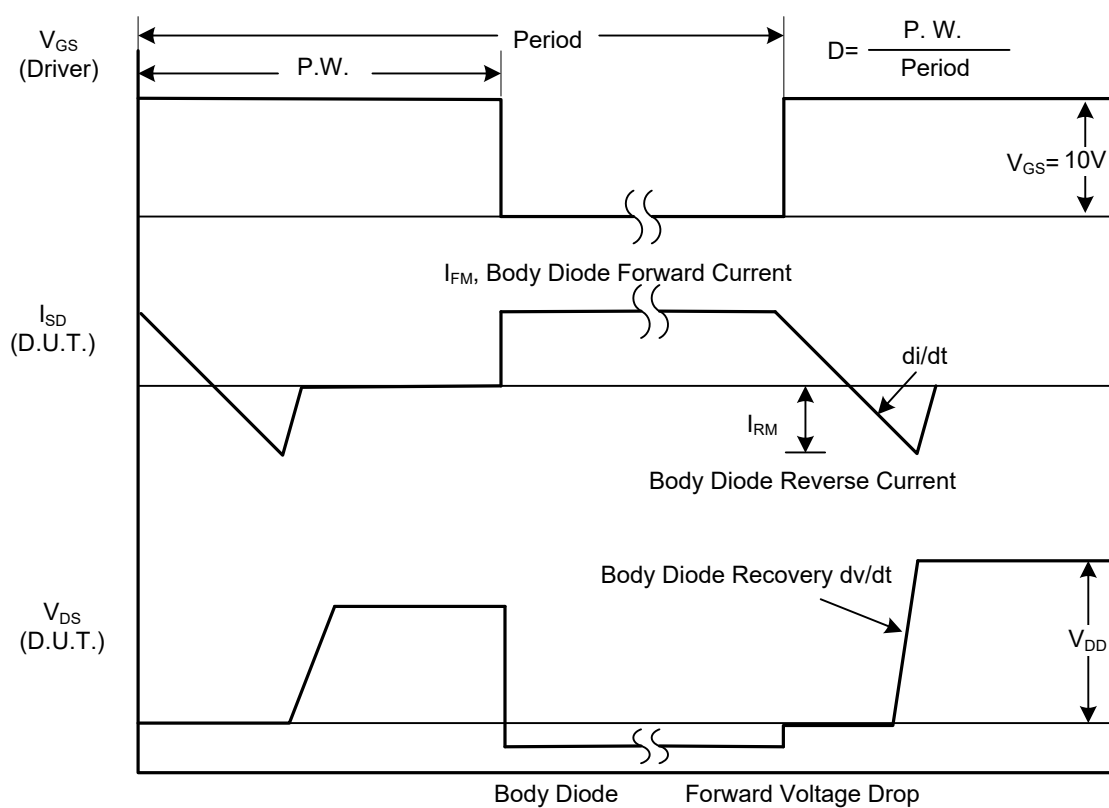
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

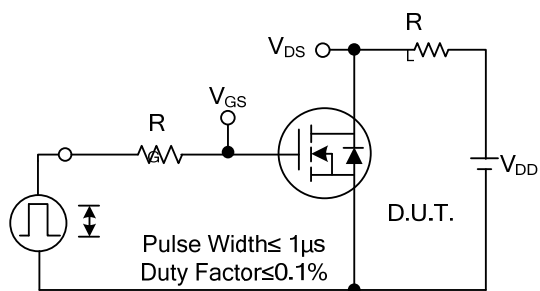


Peak Diode Recovery dv/dt Test Circuit

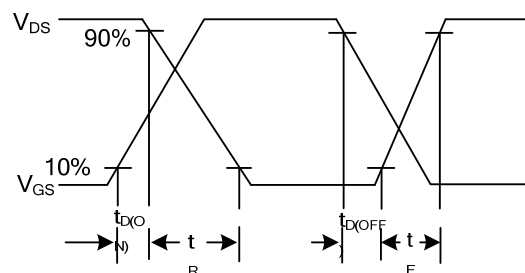


Peak Diode Recovery dv/dt Waveforms

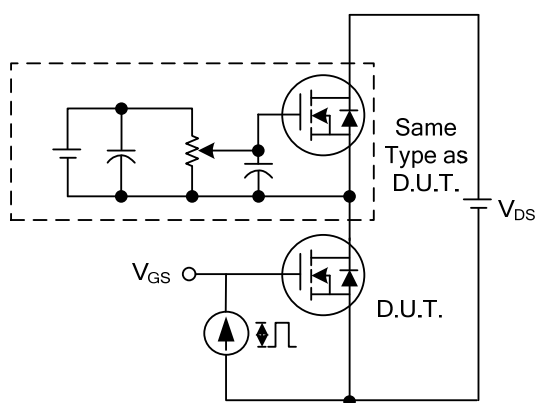
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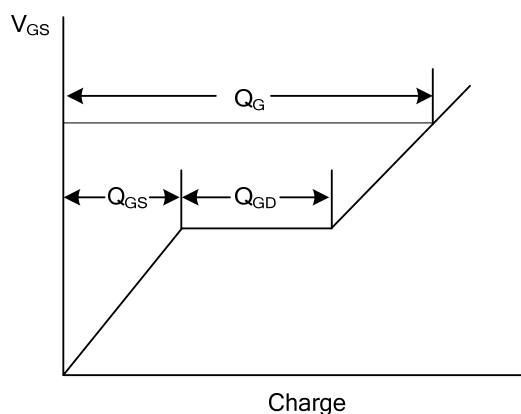
Switching Test Circuit



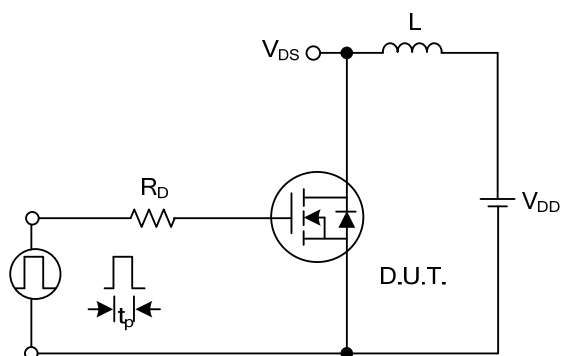
Switching Waveforms



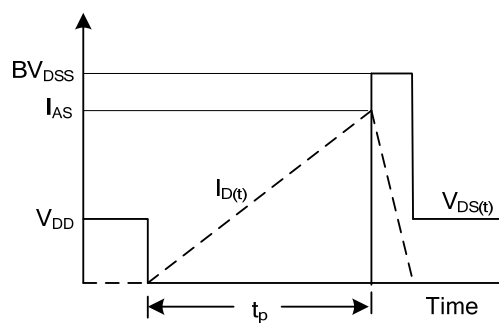
Gate Charge Test Circuit



Gate Charge Waveform

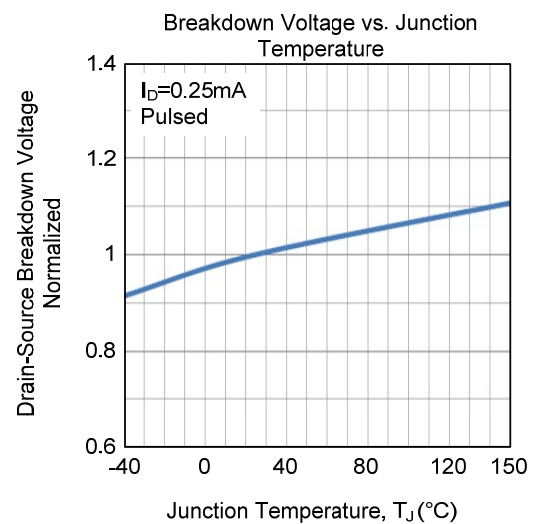
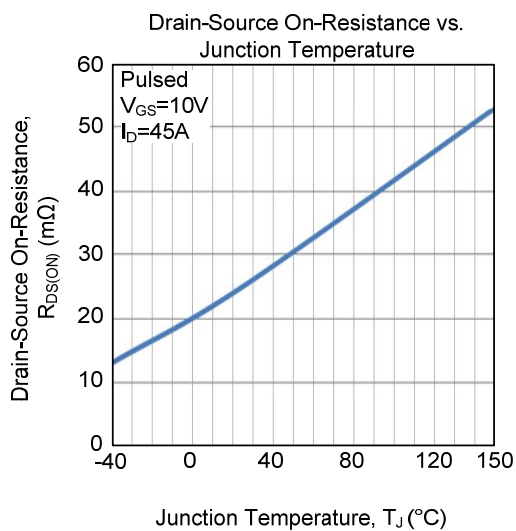
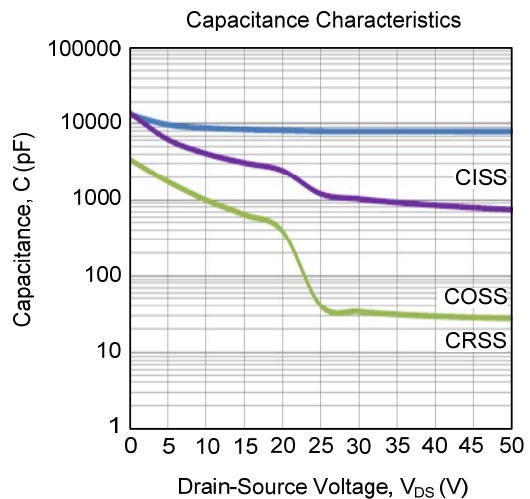
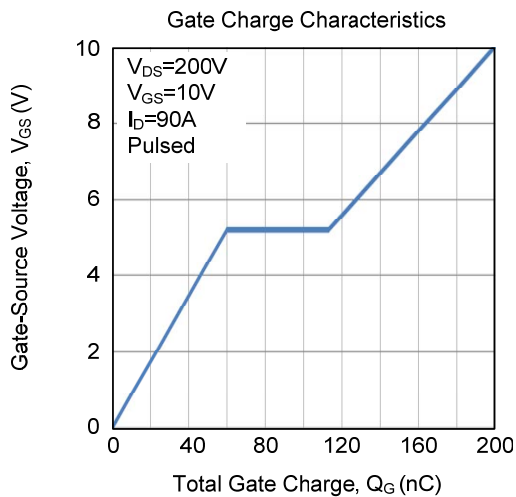
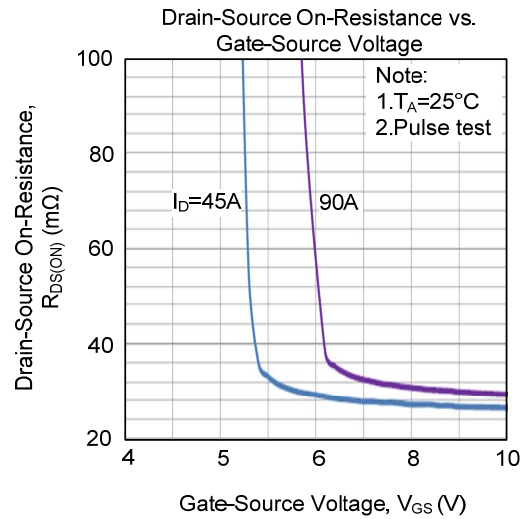
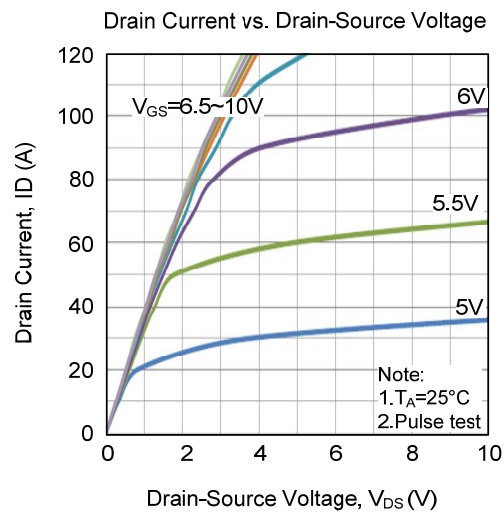


Unclamped Inductive Switching Test Circuit

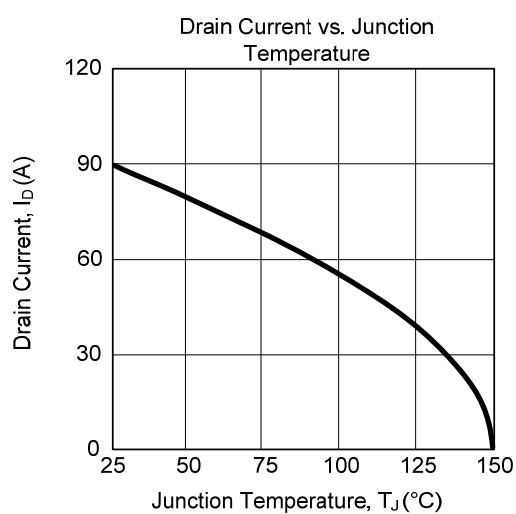
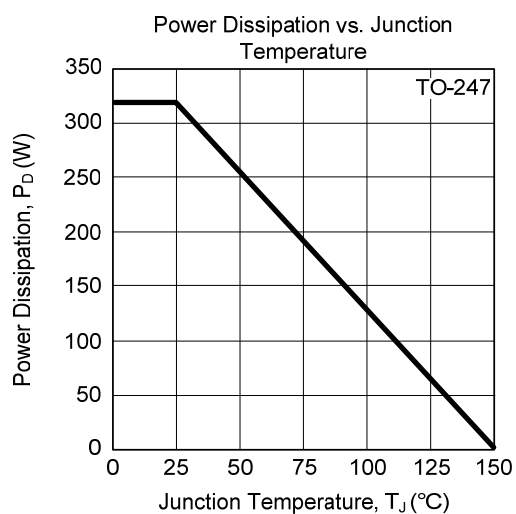
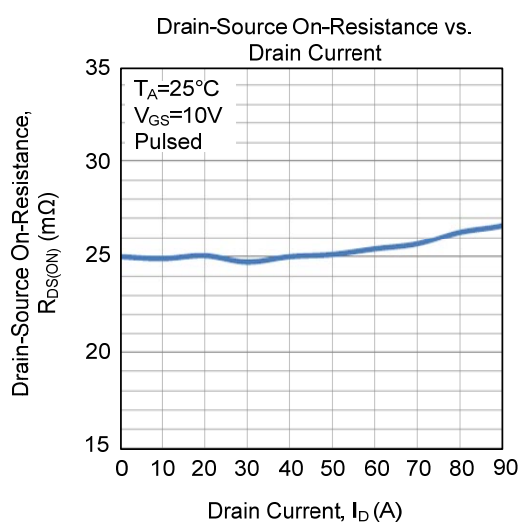
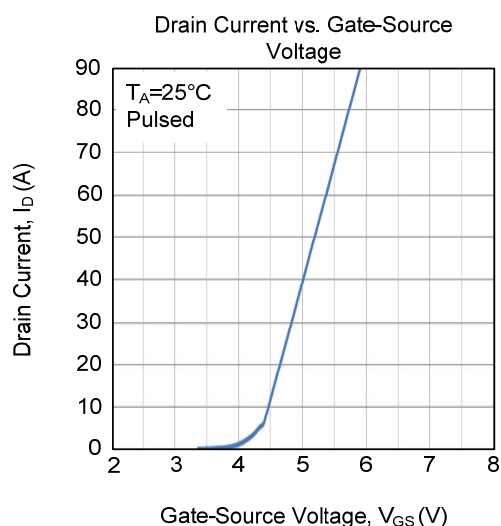
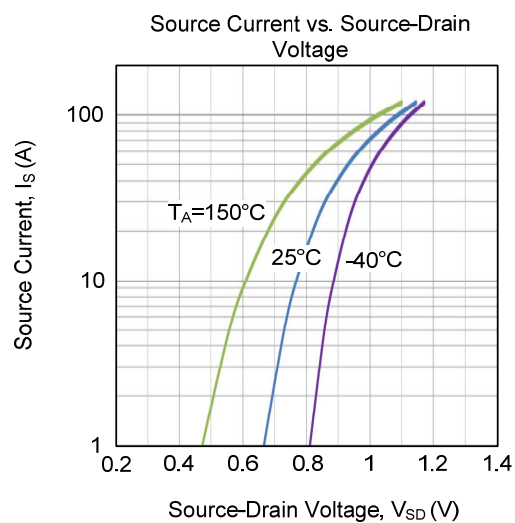
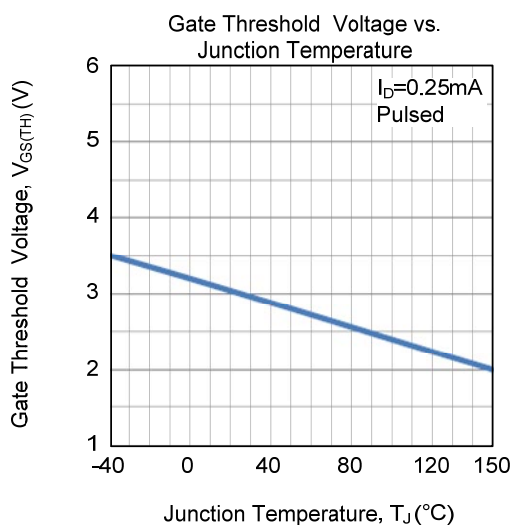


Unclamped Inductive Switching Waveforms

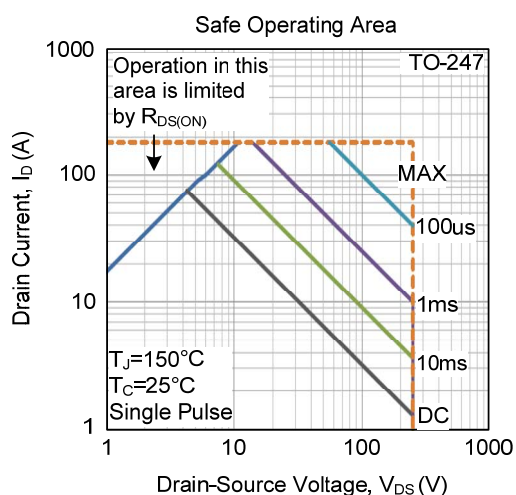
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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