



UT9564

Power MOSFET

-40V, -7.3A P-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

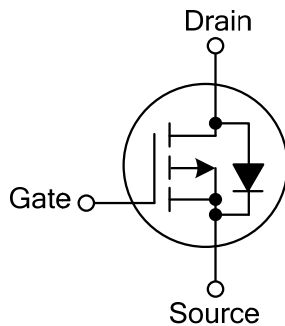
The UTC **UT9564** is a P-ch enhancement mode power MOSFET and it uses UTC perfect technology to provide customers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The UTC **UT9564** is ideal for applications such as low voltage applications, DC/DC converters and all commercial-industrial surface mount applications.

FEATURES

- * Simple Drive Requirement
- * Fast Switching Speed
- * Low On-Resistance

SYMBOL

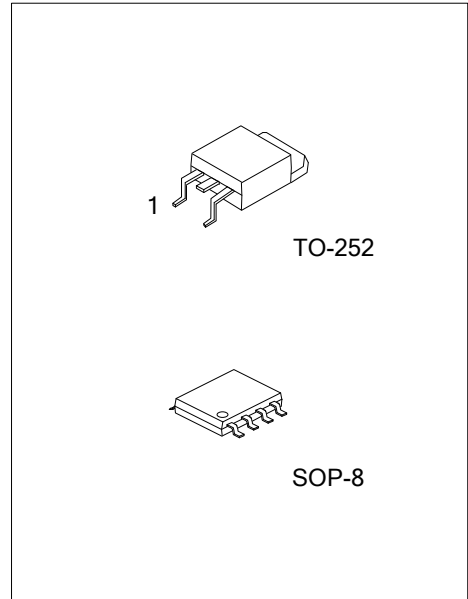


ORDERING INFORMATION

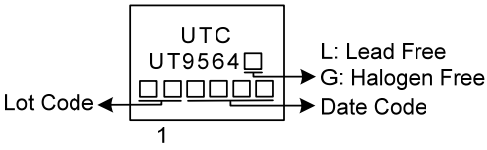
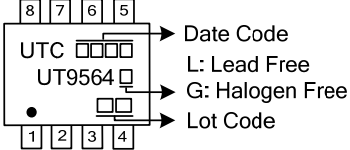
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT9564L-TN3-R	UT9564G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT9564L-S08-R	UT9564G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT9564G-TN3-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) TN3: TO-252, S08: SOP-8
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING

TO-252	SOP-8
 <p>Diagram of TO-252 marking: The package is marked with 'UTC' and 'UT9564'. Below 'UT9564' are five squares. The first square is labeled 'Lot Code' with an arrow pointing left. The next three squares are labeled 'Date Code' with an arrow pointing right. The fifth square is labeled 'L: Lead Free' and 'G: Halogen Free' with an arrow pointing right. A '1' is at the bottom left.</p>	 <p>Diagram of SOP-8 marking: The package is marked with 'UTC' and 'UT9564'. Above the marking are five squares labeled 8, 7, 6, 5, 4. Below the marking are four squares labeled 1, 2, 3, 4. The first square is labeled 'Date Code' with an arrow pointing right. The next two squares are labeled 'L: Lead Free' and 'G: Halogen Free' with an arrow pointing right. The fourth square is labeled 'Lot Code' with an arrow pointing right.</p>

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DS}	-40	V
Gate-Source Voltage		V _{GS}	±25	V
Continuous Drain Current (Note 2)	T _A =25°C	I _D	-7.3	A
	T _A =70°C		-5.9	A
Pulsed Drain Current (Note 1)		I _{DM}	-30	A
Power Dissipation (T _A =25°C)	TO-252	P _D	50	W
	SOP-8		6.25	
Junction Temperature		T _J	-55 ~ +150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2)	TO-252	θ_{JA}	110	°C/W
	SOP-8		150	

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

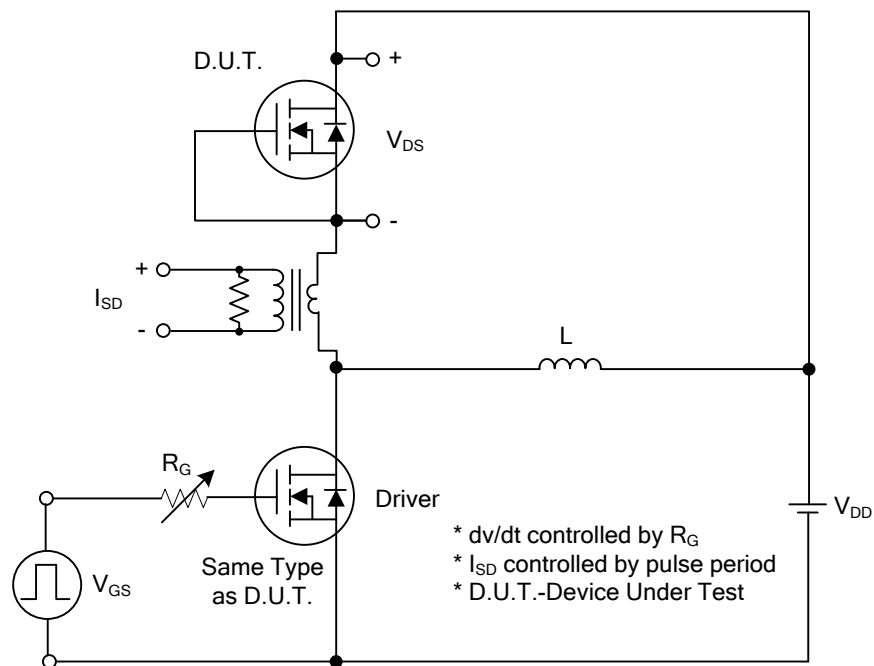
2. Surface mounted on 1 in² copper pad of FR4 board, $t \leq 10\text{sec}$; 125°C/W when mounted on Min. copper pad.

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

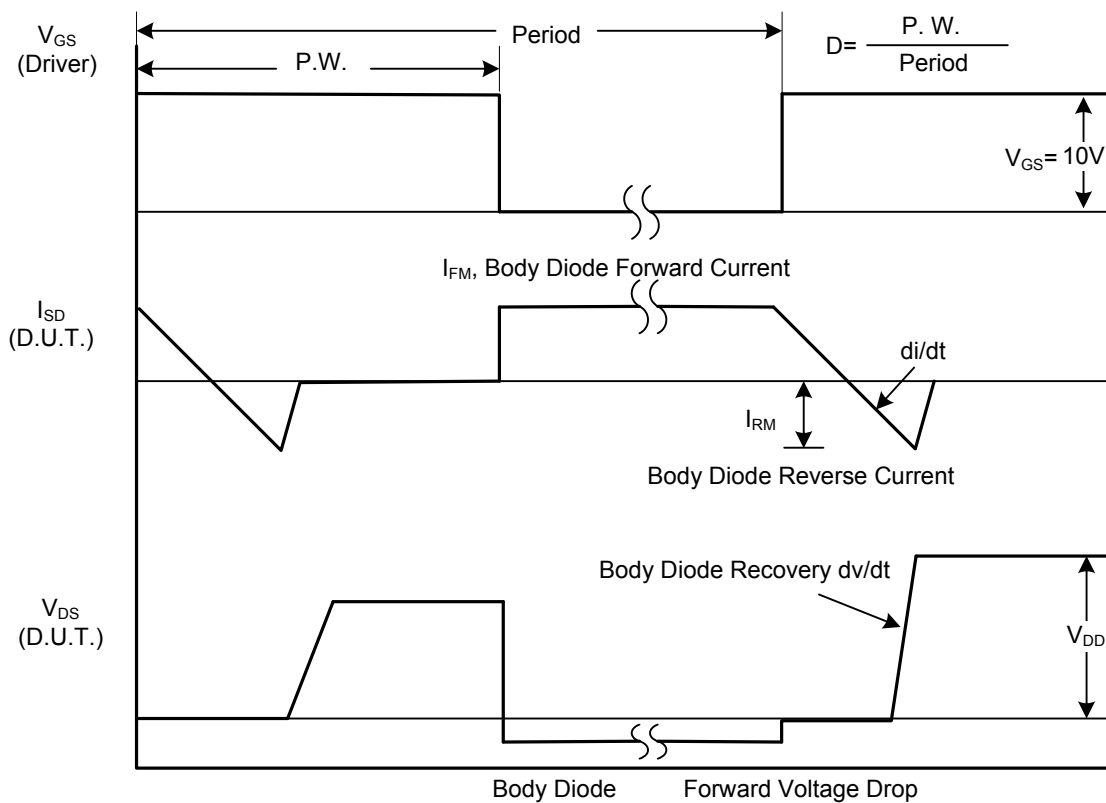
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V, T _J =25°C			-1	μA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =±25V			±100	nA
ON 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 (Note)	R _{DS(ON)}	V _{GS} =-10V, I _D =-7A			28	mΩ
		V _{GS} =-4.5V, I _D =-5A			40	
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		2590		pF
Output Capacitance	C _{OSS}			283		pF
Reverse Transfer Capacitance	C _{RSS}			202		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q _G	V _{GS} =-4.5V, V _{DS} =-20V, I _D =-7A		27	43	nC
Gate to Source Charge	Q _{GS}			9		nC
Gate to Drain Charge	Q _{GD}			10		nC
Turn-ON Delay Time (Note)	t _{D(ON)}	V _{GS} =-10V, V _{DS} =-20V, I _D =-7A, R _G =3.3Ω		5		ns
Rise Time	t _R			17		ns
Turn-OFF Delay Time	t _{D(OFF)}			68		ns
Fall-Time	t _F			43		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				-7.3	A
Maximum Body-Diode Pulsed Current	I _{SM}				-30	A
Drain-Source Diode Forward Voltage (Note)	V _{SD}	I _S =-7A, V _{GS} =0V			-1.2	V
Reverse Recovery Time (Note)	t _{rr}	I _S =-7A, V _{GS} =0V,		53		ns
Reverse Recovery Charge	Q _{rr}	dl/dt=100A/μs		55		nC

Note: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

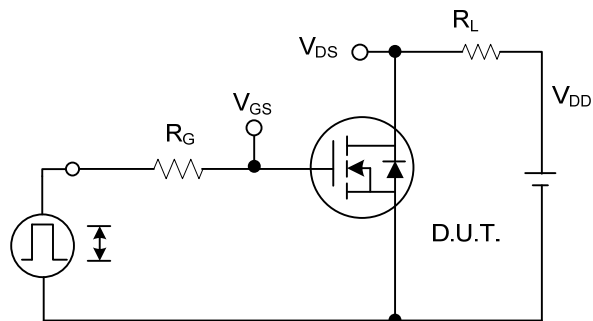


Peak Diode Recovery dv/dt Test Circuit

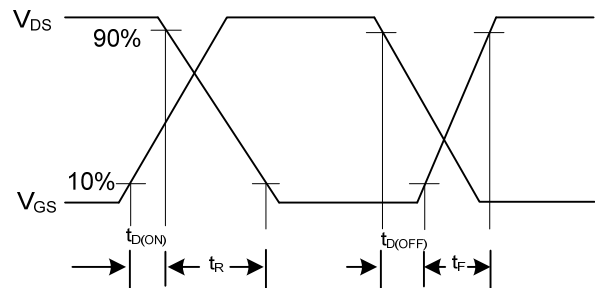


Peak Diode Recovery dv/dt Waveforms

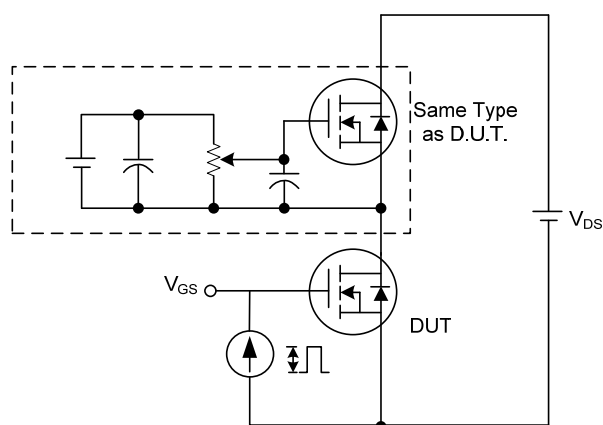
■ TEST CIRCUITS AND WAVEFORMS



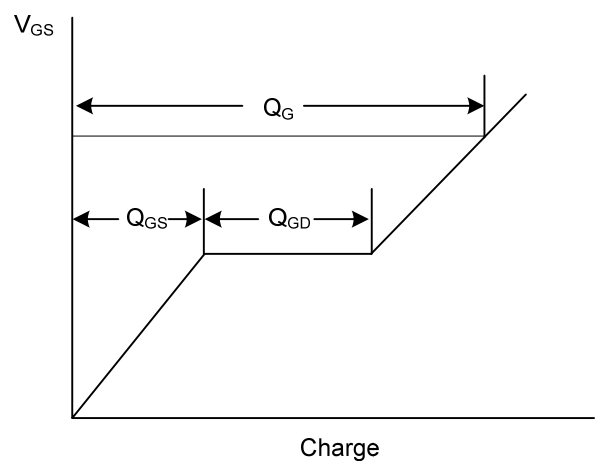
Switching Test Circuit



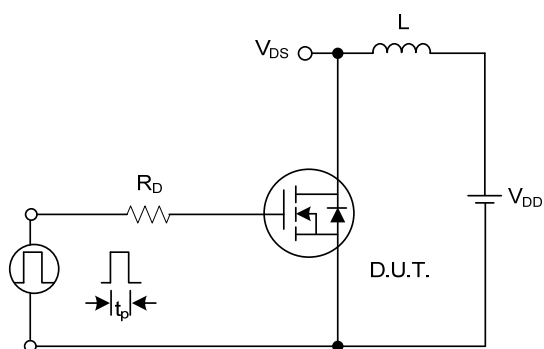
Switching Waveforms



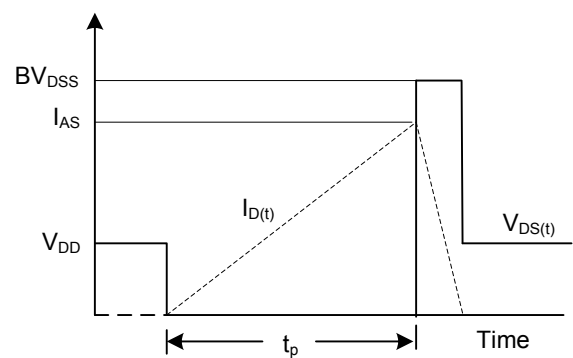
Gate Charge Test Circuit



Gate Charge Waveform

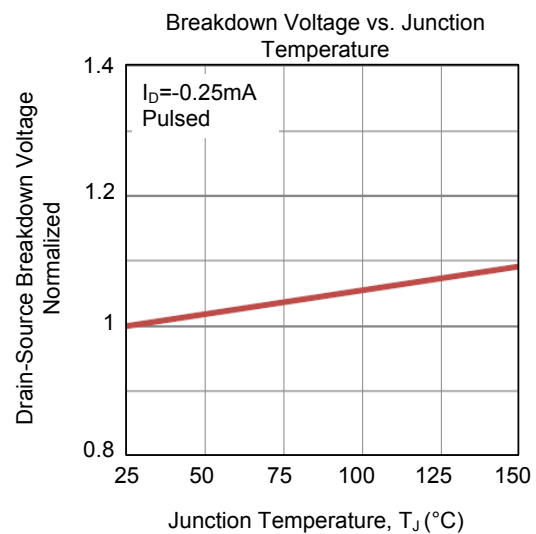
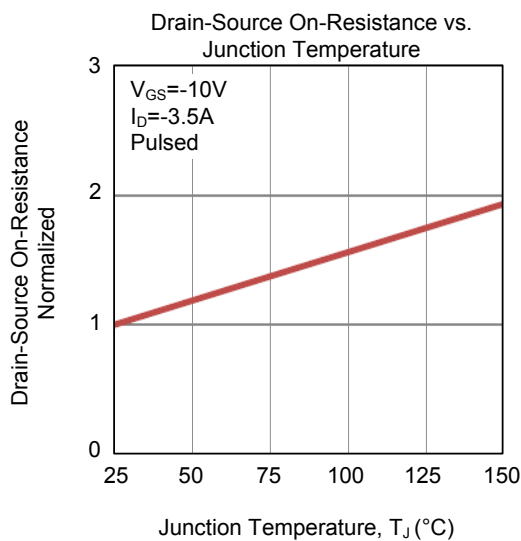
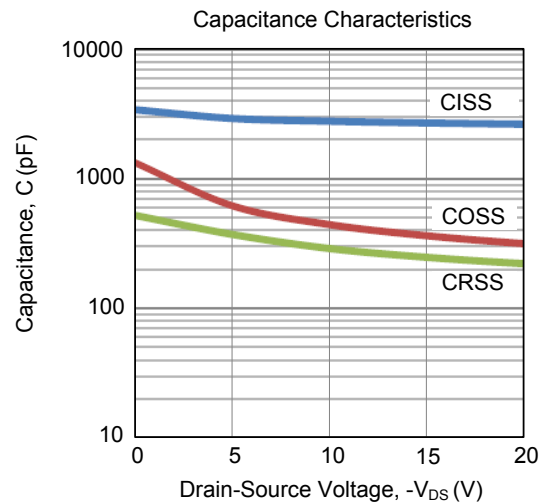
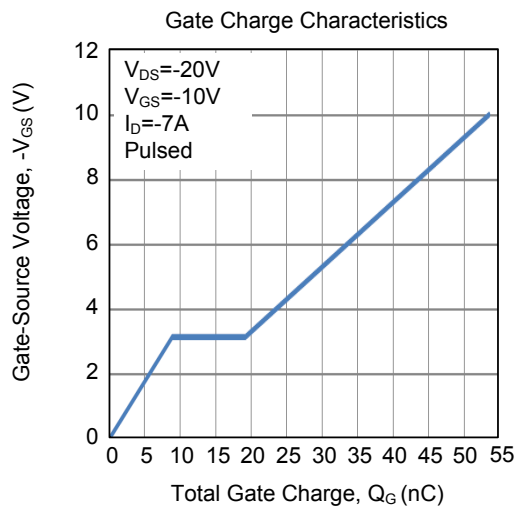
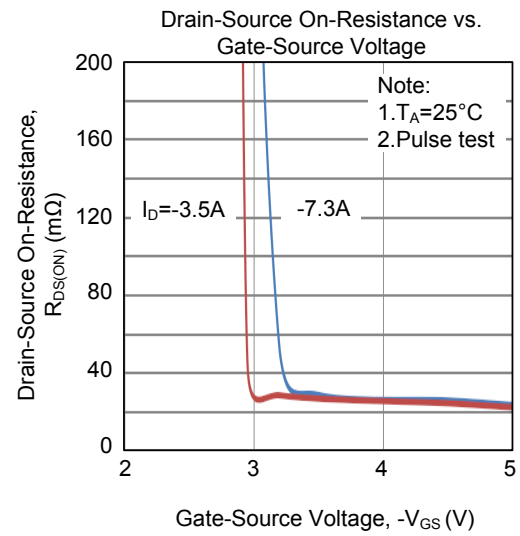
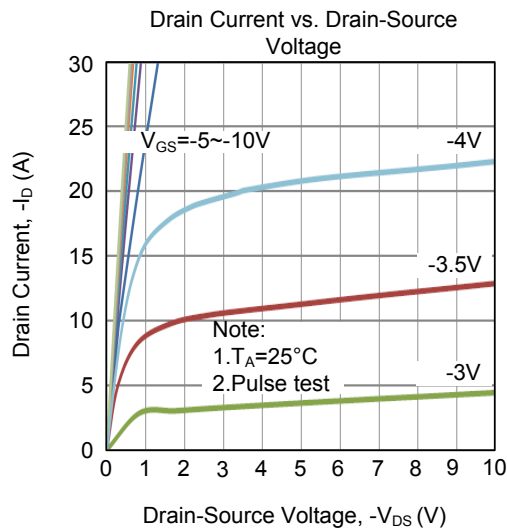


Unclamped Inductive Switching Test Circuit

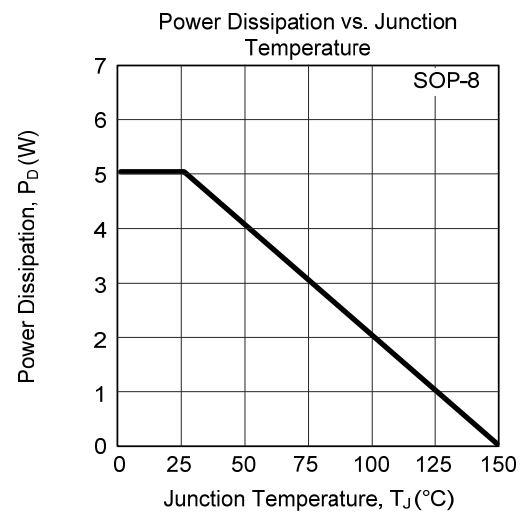
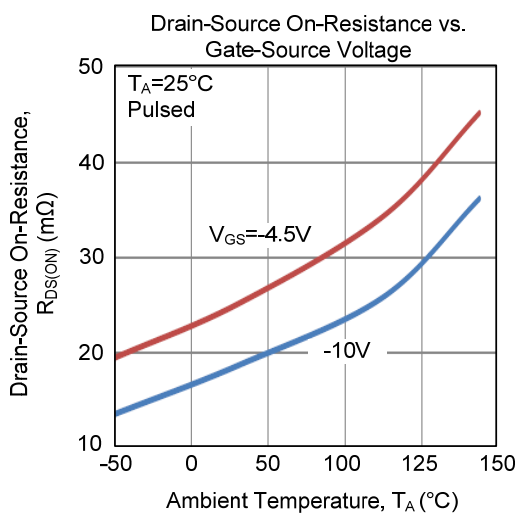
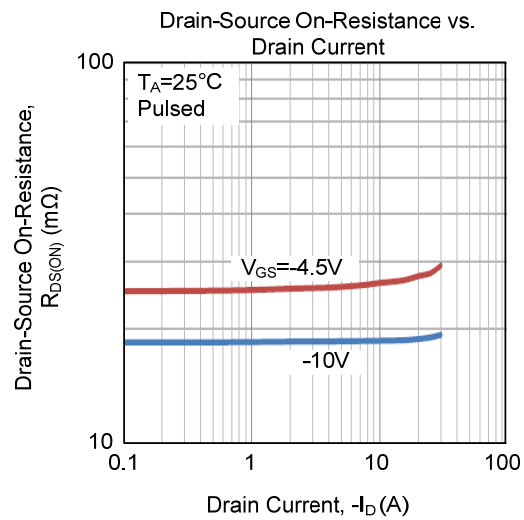
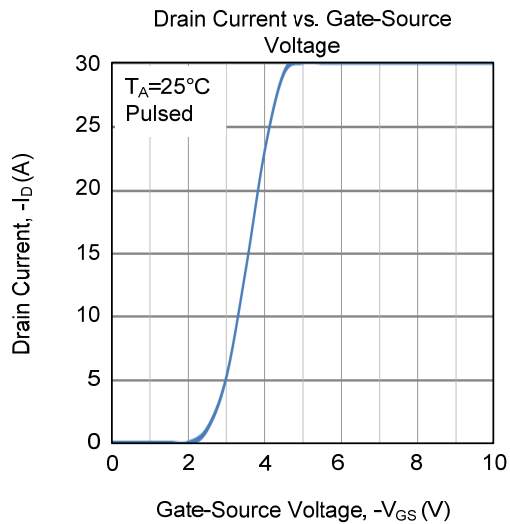
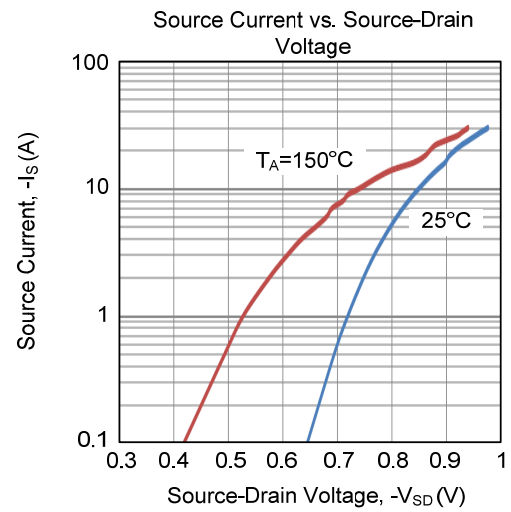
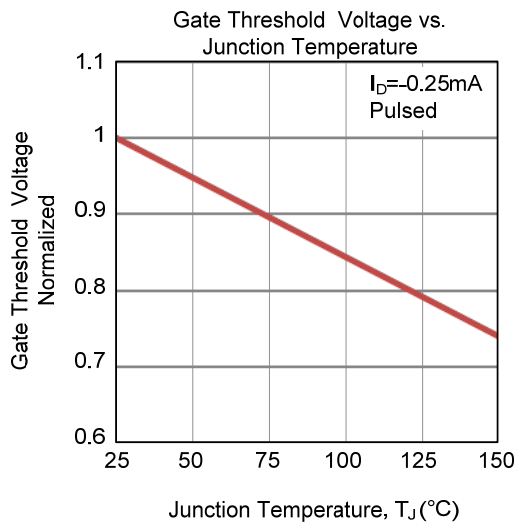


Unclamped Inductive Switching Waveforms

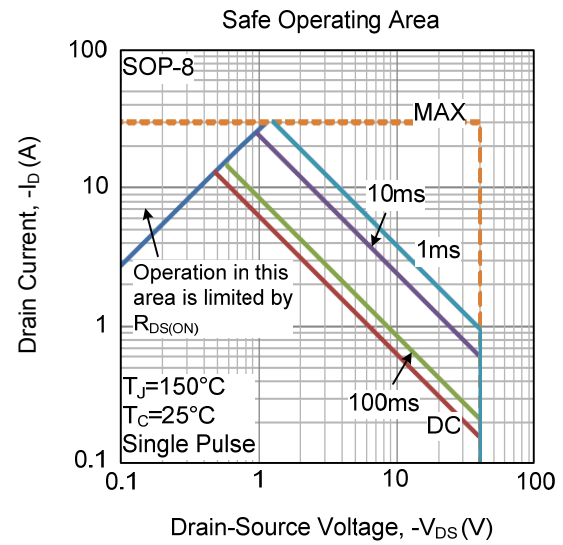
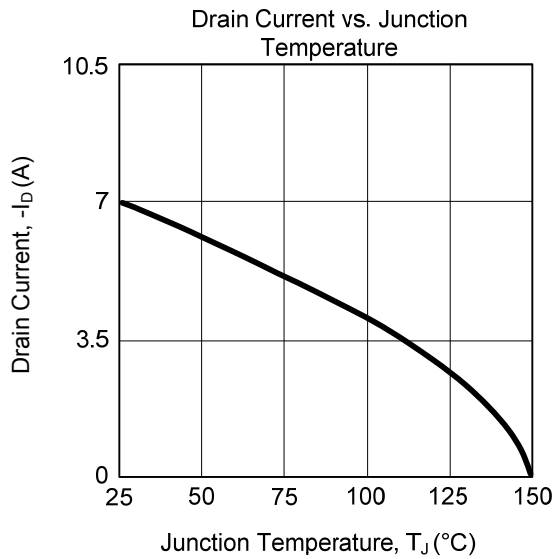
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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