



UT9564

Preliminary

Power MOSFET

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

DESCRIPTION

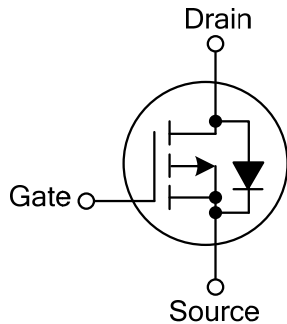
The UTC **UT9564** is a P-ch enhancement mode power MOSFET and it uses UTC perfect technology to provide customers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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

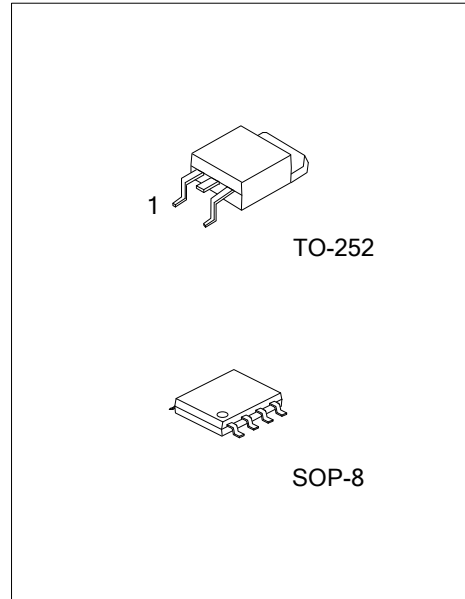


ORDERING INFORMATION

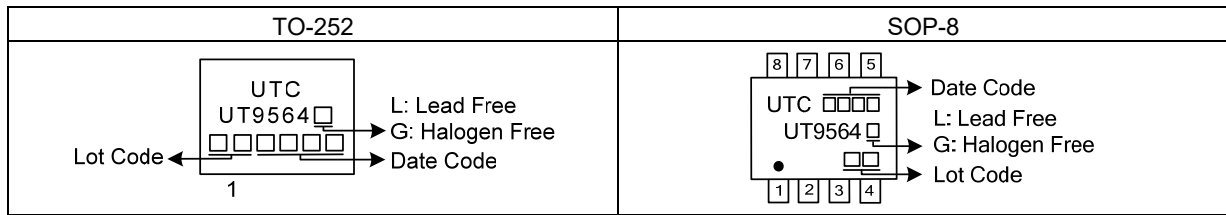
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT9564L-TN3-R	UT9564G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT9564L-S08-R	UT9564G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

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



■ 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)	I_D	$T_A=25^\circ\text{C}$	-7.3	A
		$T_A=70^\circ\text{C}$	-5.9	A
Pulsed Drain Current (Note 1)	I_{DM}	-30	A	
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	TO-252	54	W
		SOP-8	2.2	W
Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$	
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$	

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)	θ_{JA}	TO-252	50	$^\circ\text{C/W}$
		SOP-8	90	$^\circ\text{C/W}$
Junction to Case	θ_{JC}	TO-252	2.3	$^\circ\text{C/W}$
		SOP-8	56	$^\circ\text{C/W}$

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.

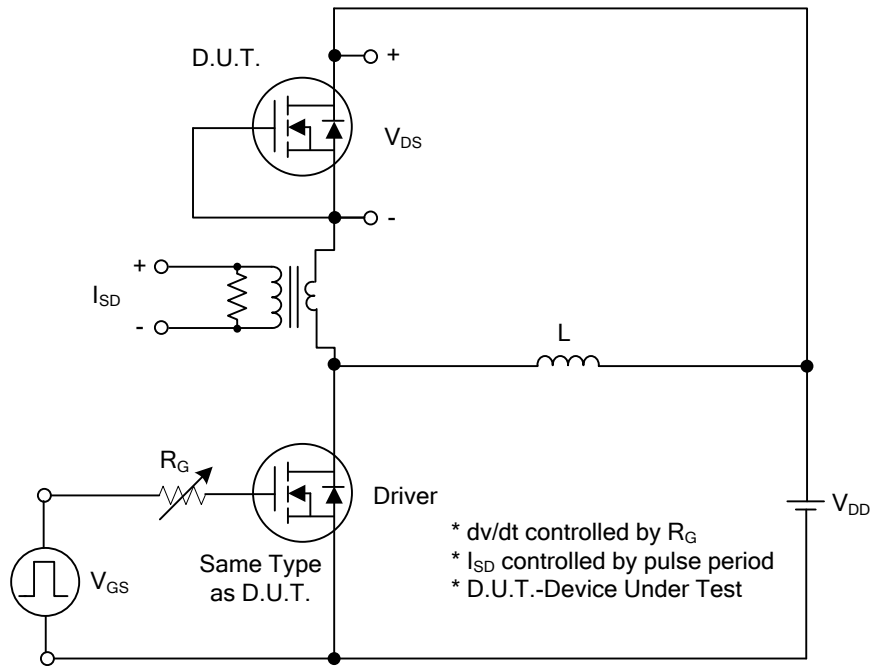
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-40			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -40\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 25^\circ\text{C}$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 25\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	-1.0		-3.0	V
Static Drain-Source On-State Resistance (Note)	$R_{DS(ON)}$	$V_{GS} = -10\text{V}$, $I_D = -7\text{A}$			28	m Ω
		$V_{GS} = -4.5\text{V}$, $I_D = -5\text{A}$			40	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{V}$, $V_{DS} = -25\text{V}$, $f = 1.0\text{MHz}$		3000		pF
Output Capacitance	C_{OSS}			320		pF
Reverse Transfer Capacitance	C_{RSS}			220		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q_G	$V_{GS} = -4.5\text{V}$, $V_{DS} = -20\text{V}$, $I_D = -7.0\text{A}$		32		nC
Gate to Source Charge	Q_{GS}			14		nC
Gate to Drain Charge	Q_{GD}			9		nC
Turn-ON Delay Time (Note)	$t_{D(ON)}$	$V_{GS} = -10\text{V}$, $V_{DS} = -20\text{V}$, $I_D = -7.0\text{A}$, $R_G = 3.3\Omega$		10		ns
Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			62		ns
Fall-Time	t_F			32		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}	$I_S = -7.0\text{A}$, $V_{GS} = 0\text{V}$			-1.2	V
Reverse Recovery Time (Note)	t_{rr}	$I_S = -7.0\text{A}$, $V_{GS} = 0\text{V}$, $dI/dt = 100\text{A}/\mu\text{s}$		75		ns
Reverse Recovery Charge	Q_{rr}			100		nC

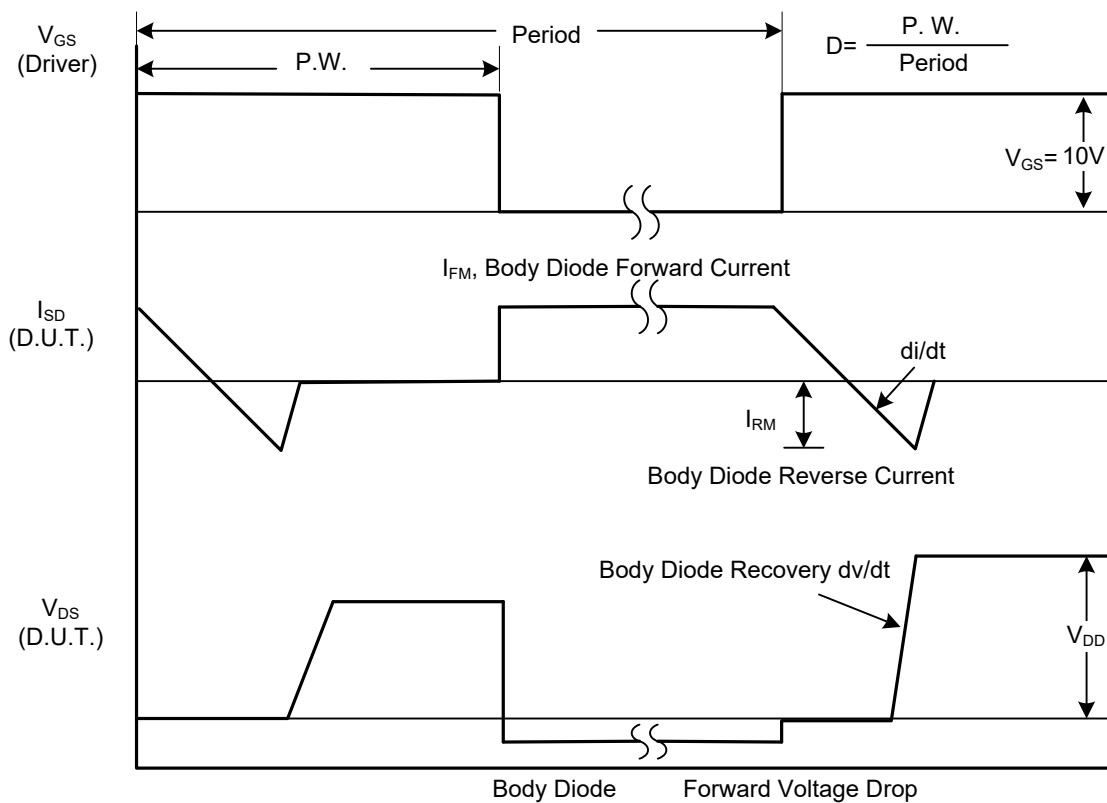
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

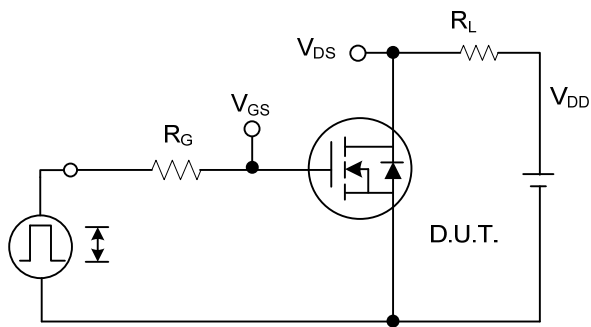


Peak Diode Recovery dv/dt Test Circuit

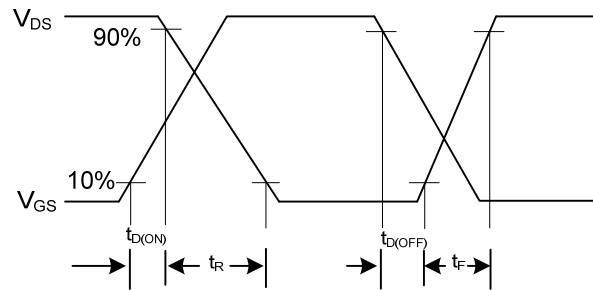


Peak Diode Recovery dv/dt Waveforms

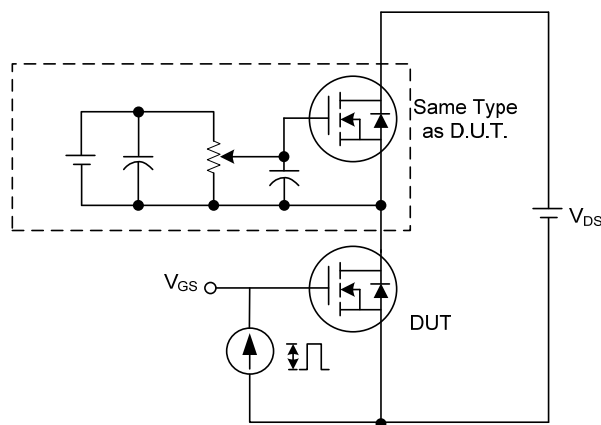
TEST CIRCUITS AND WAVEFORMS



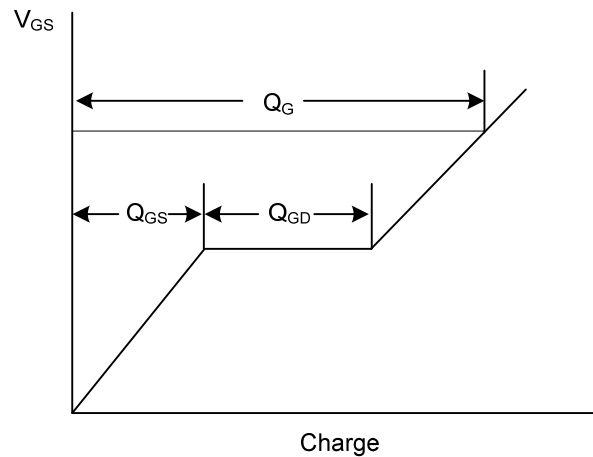
Switching Test Circuit



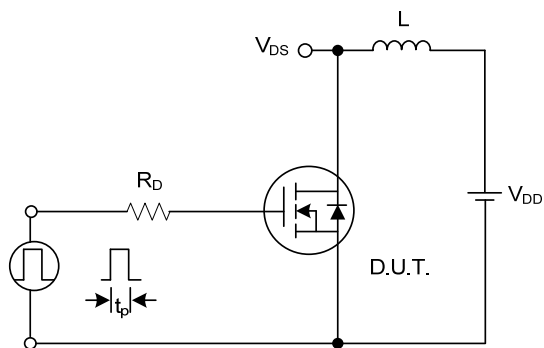
Switching Waveforms



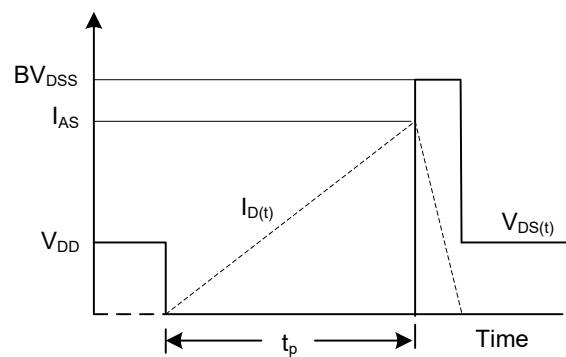
Gate Charge Test Circuit



Gate Charge Waveform

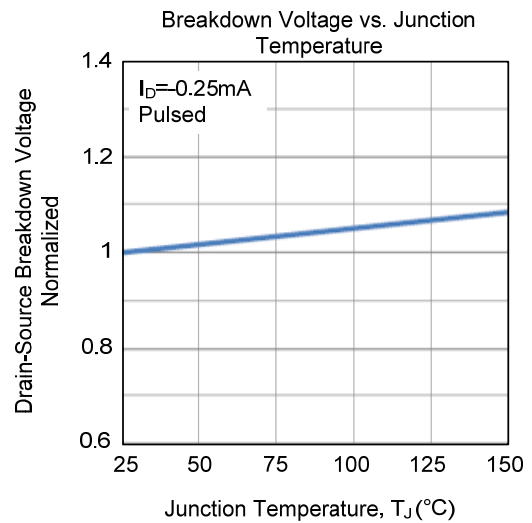
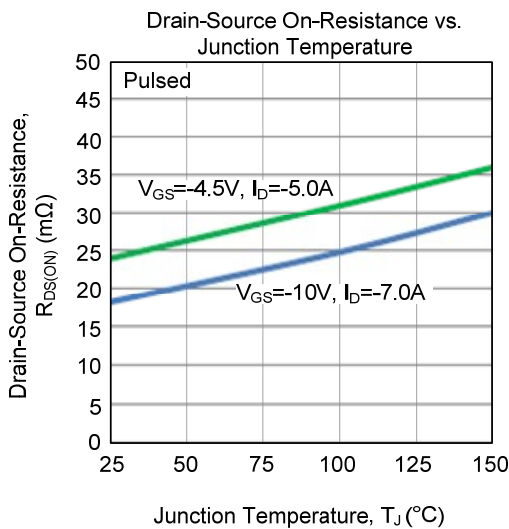
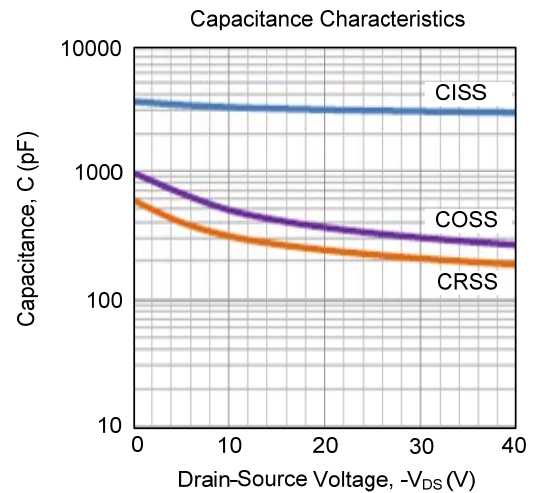
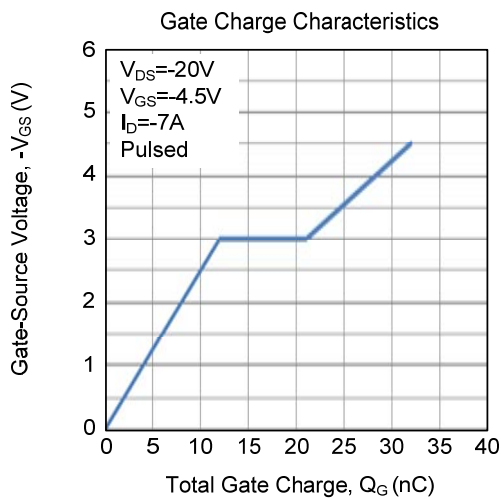
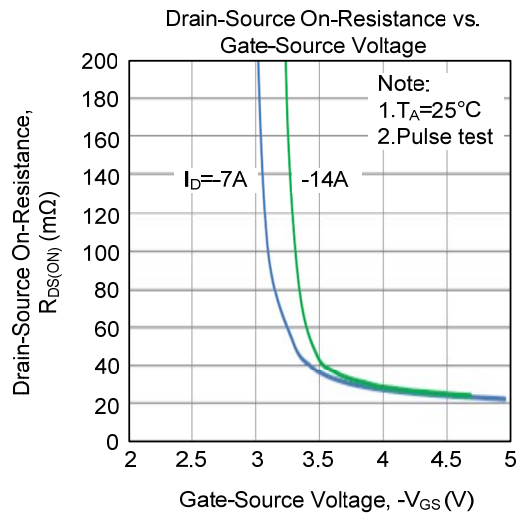
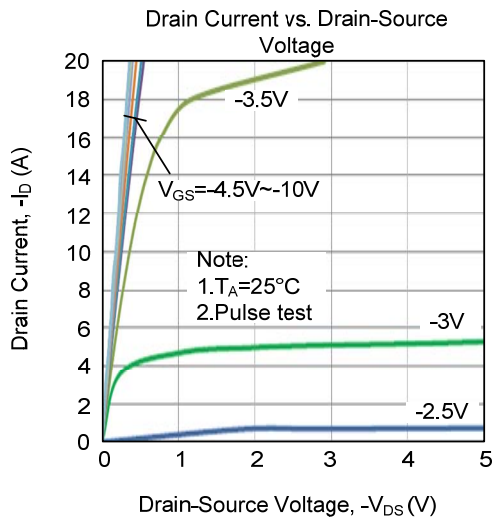


Unclamped Inductive Switching Test Circuit

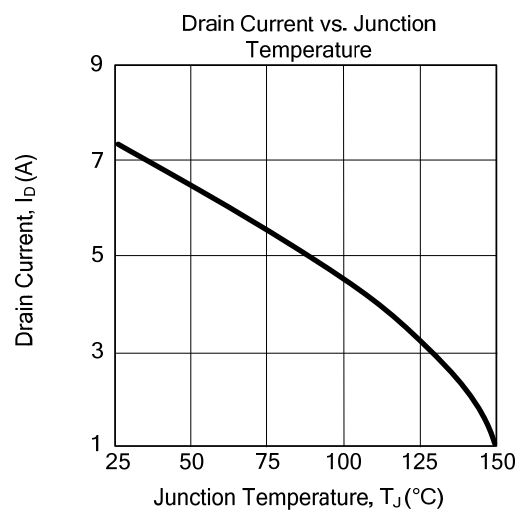
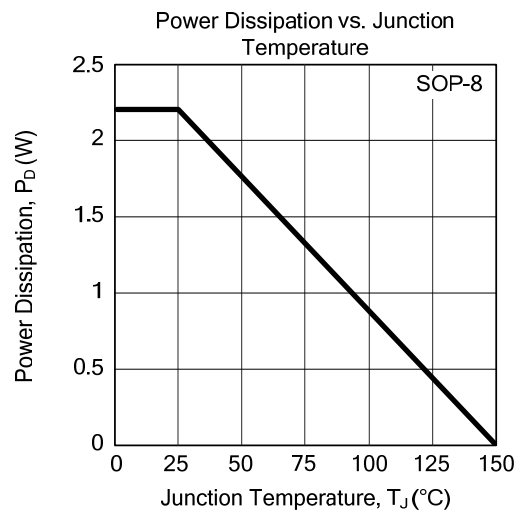
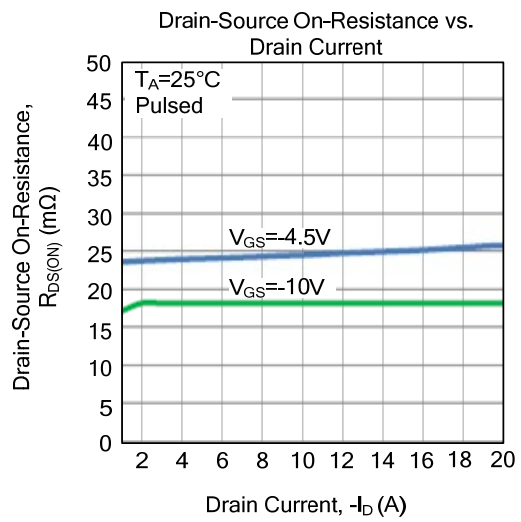
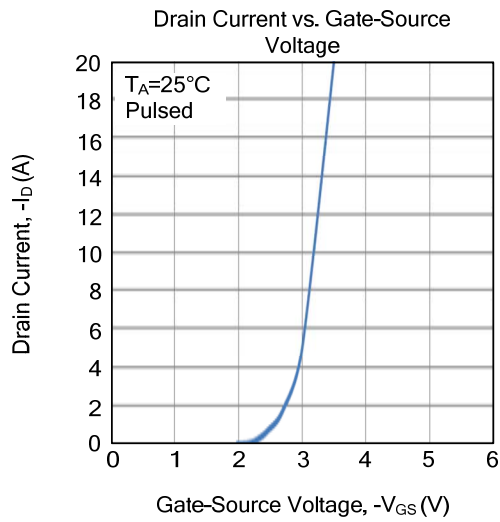
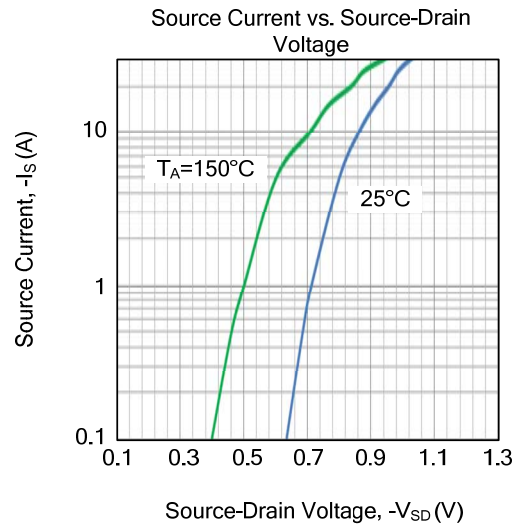
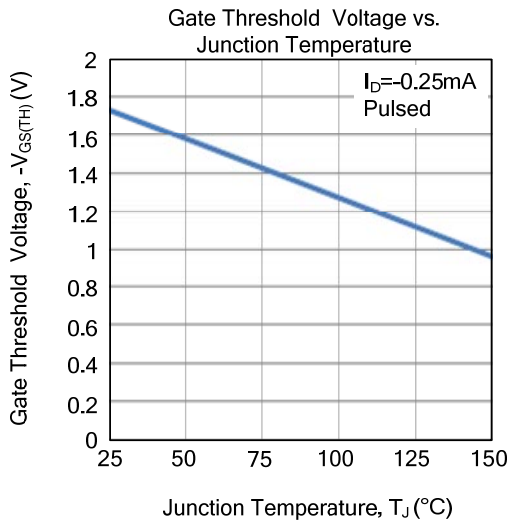


Unclamped Inductive Switching Waveforms

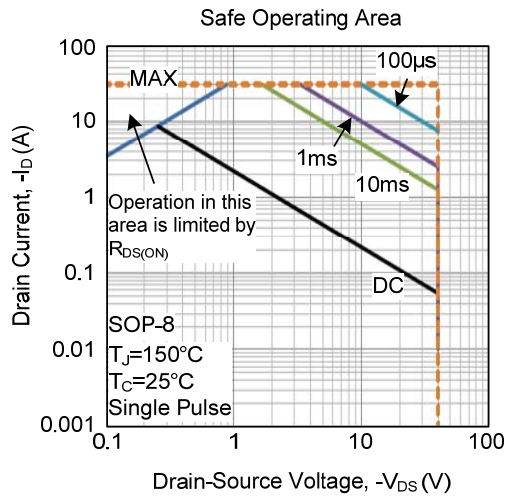
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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