



UT4450

Power MOSFET

**7A, 40V N-CHANNEL
POWER MOSFET**

■ DESCRIPTION

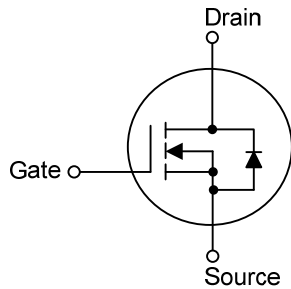
The UTC **UT4450** is an N-channel MOSFET. it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

The UTC **UT4450** is suitable for PWM applications or use as a load switch.

■ FEATURES

- * $R_{DS(ON)} \leq 30\ m\Omega$ @ $V_{GS}=10V, I_D=7.0A$
- $R_{DS(ON)} \leq 38\ m\Omega$ @ $V_{GS}=4.5V, I_D=5.0A$
- * High switching speed
- * Low gate charge

■ SYMBOL

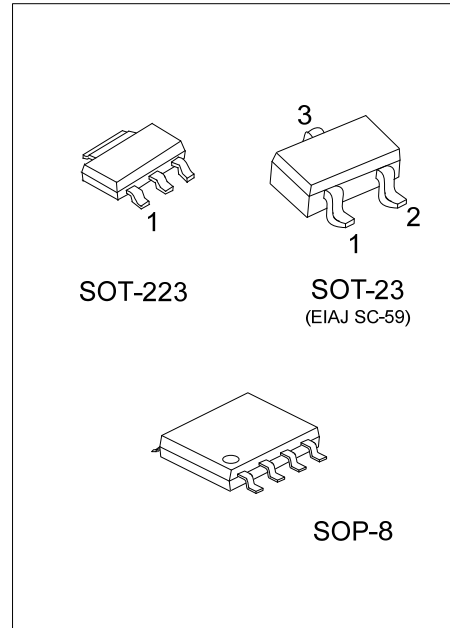


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4450L-AA3-R	UT4450G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT4450L-AE3-R	UT4450G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT4450L-S08-R	UT4450G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

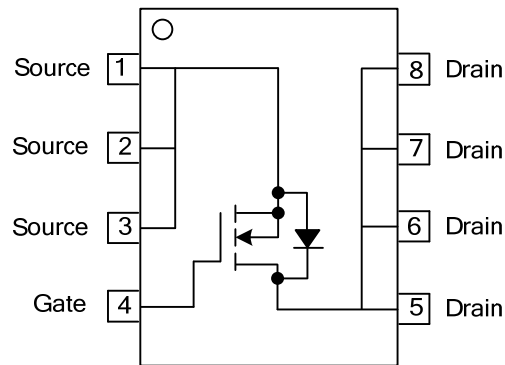
<p>UT4450G-AA3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-23, AE3: SOT-23, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

PACKAGE	MARKING
SOT-223	<p>UT4450 1 L: Lead Free G: Halogen Free Date Code</p>
SOT-23	<p>4450 L: Lead Free G: Halogen Free</p>
SOP-8	<p>8 7 6 5 UTC UT4450 1 2 3 4 Date Code L: Lead Free G: Halogen Free Lot Code</p>

PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous $T_A=25^\circ\text{C}$	I_D	7	A
	Pulsed (Note 2)	I_{DM}	28	A
Avalanche Current (Note 2)		I_{AS}	14	A
Avalanche Energy	$L=0.1\text{mH}$ (Note 2)	E_{AS}	10	mJ
Power Dissipation ($T_A=25^\circ\text{C}$) (Note 3)	SOT-223	P_D	2	W
	SOT-23		1	W
	SOP-8		3.1	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		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 junction temperature $T_{J(\text{MAX})}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.

3. Based on $T_{J(\text{MAX})}=150^\circ\text{C}$, using $\leq 10\text{s}$.

■ THERMAL DATA

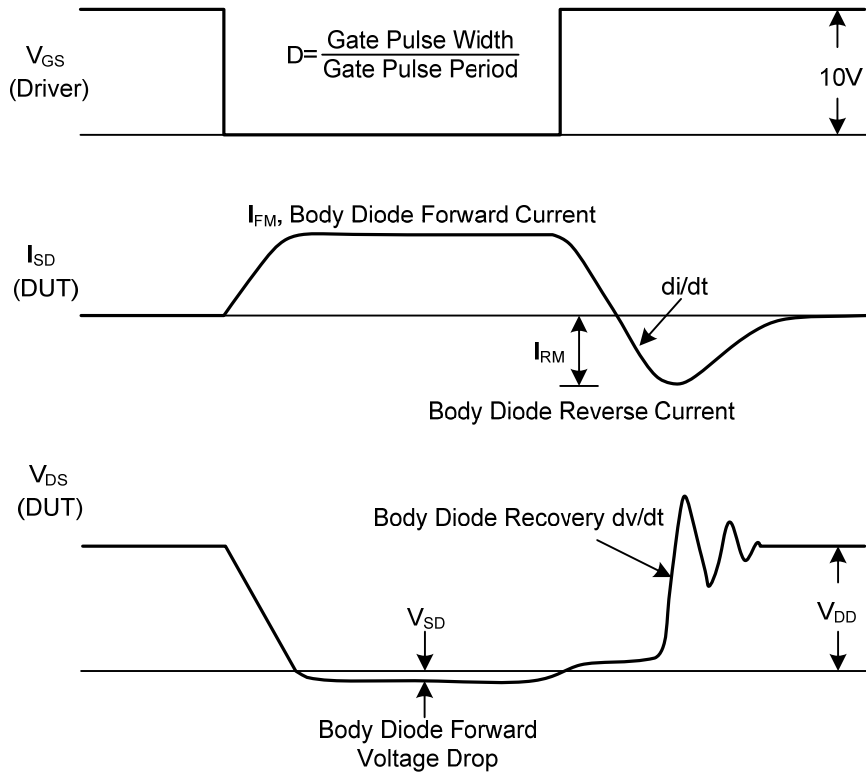
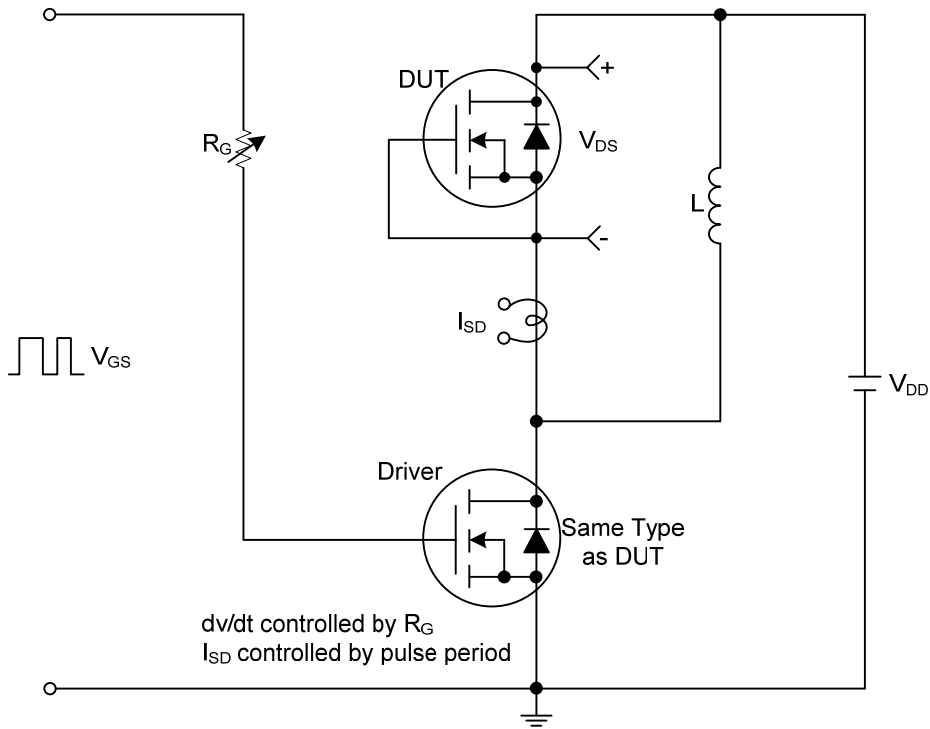
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	180	$^\circ\text{C/W}$
	SOT-23		325	$^\circ\text{C/W}$
	SOP-8		90 (Note)	$^\circ\text{C/W}$
Junction to Case	SOT-223	θ_{JC}	62.5	$^\circ\text{C/W}$
	SOT-23		125	$^\circ\text{C/W}$
	SOP-8		40.3 (Note)	$^\circ\text{C/W}$

Note: The value of θ_{JA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

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

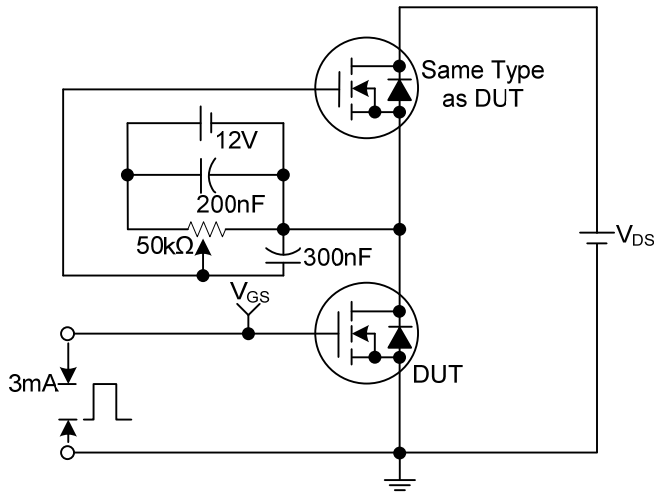
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS} V _{GS} =+20V, V _{DS} =0V V _{GS} =-20V, V _{DS} =0V			+100	nA
	Reverse				-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	R _{DS(ON)}	V _{GS} =10V, I _D =7.0A			30	mΩ
		V _{GS} =4.5V, I _D =5.0A			38	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =20V, f=1.0MHz		516		pF
Output Capacitance	C _{OSS}			82		pF
Reverse Transfer Capacitance	C _{RSS}			43		pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =20V, I _D =7.0A		8.9		nC
Gate to Source Charge	Q _{GS}			2.4		nC
Gate to Drain Charge	Q _{GD}			1.4		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =20V, V _{GS} =10V, R _{GEN} =3Ω, R _L =2.8Ω		6.4		ns
Rise Time	t _R			3.6		ns
Turn-OFF Delay Time	t _{D(OFF)}			16.2		ns
Fall-Time	t _F			6.6		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				3.5	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =1.0A, V _{GS} =0V			1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =7.0A, dI/dt=100A/μs		18		ns
Body Diode Reverse Recovery Charge	Q _{rr}				10	

■ TEST CIRCUITS AND WAVEFORMS

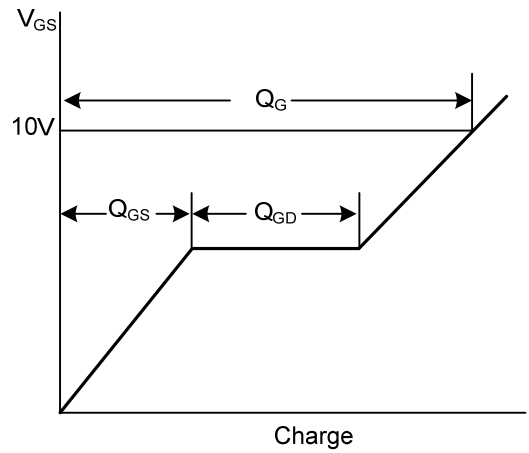


Peak Diode Recovery dv/dt Test Circuit and Waveforms

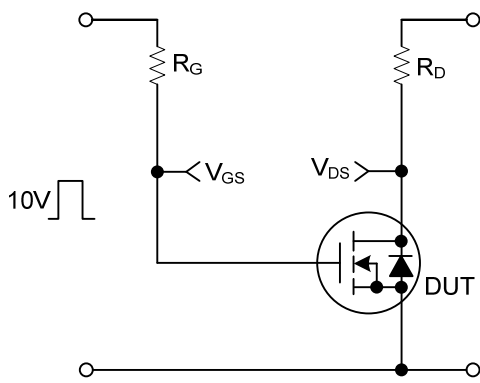
TEST CIRCUITS AND WAVEFORMS



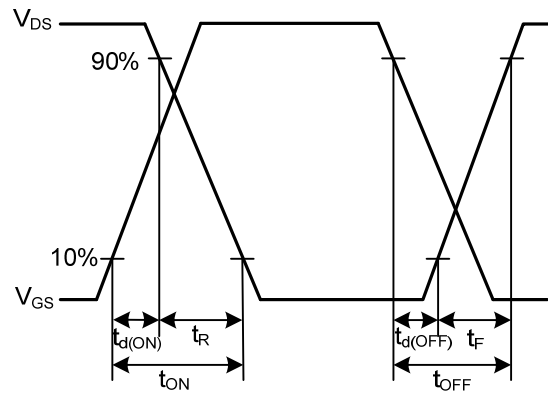
Gate Charge Test Circuit



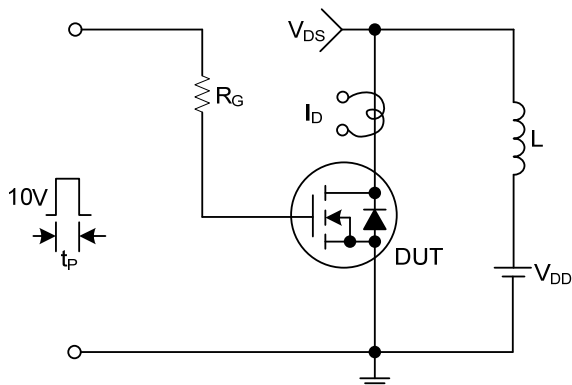
Gate Charge Waveforms



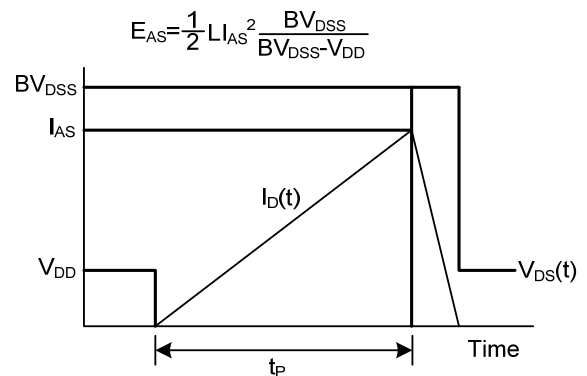
Resistive Switching Test Circuit



Resistive Switching Waveforms

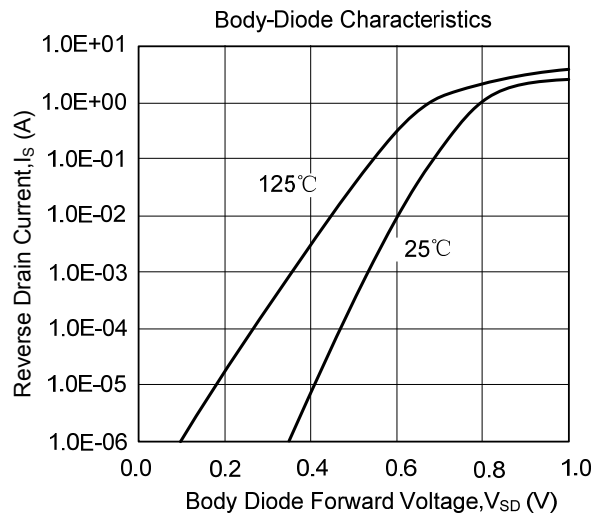
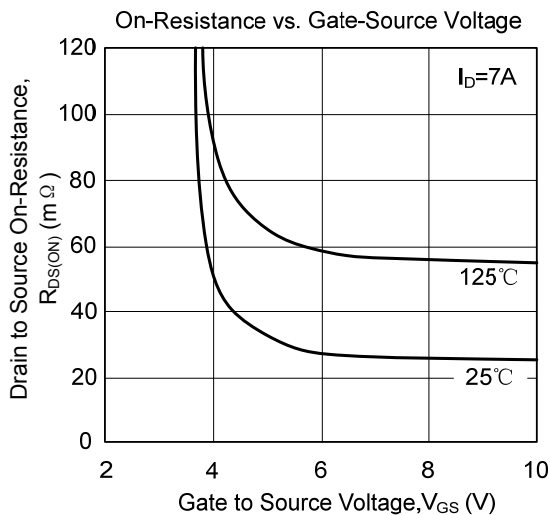
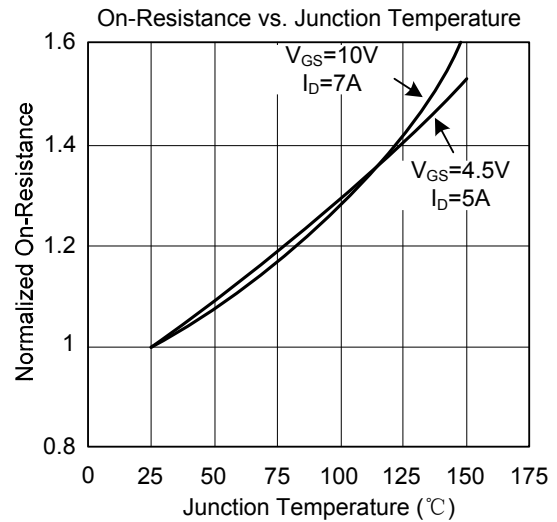
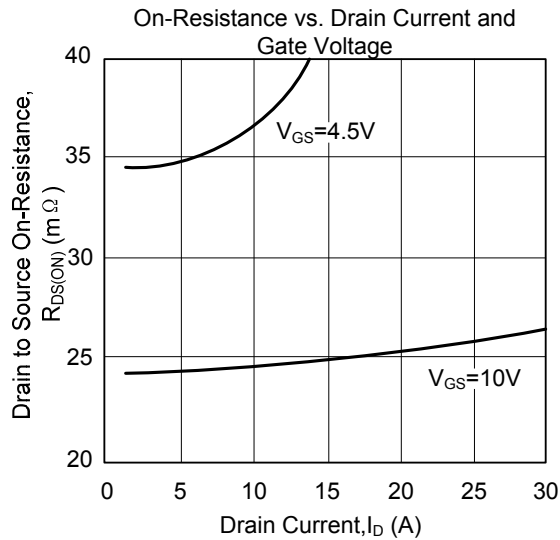
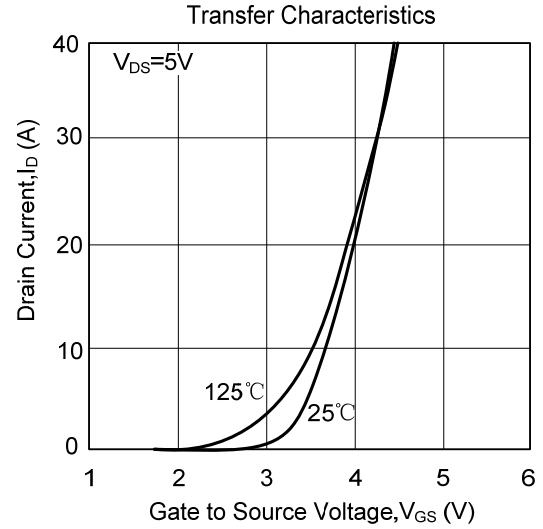
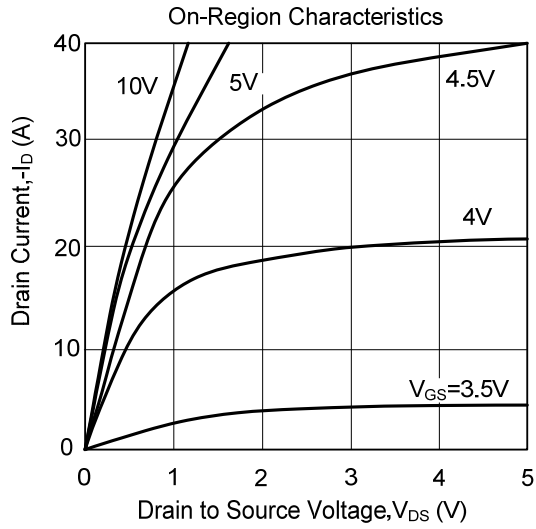


Unclamped Inductive Switching Test Circuit

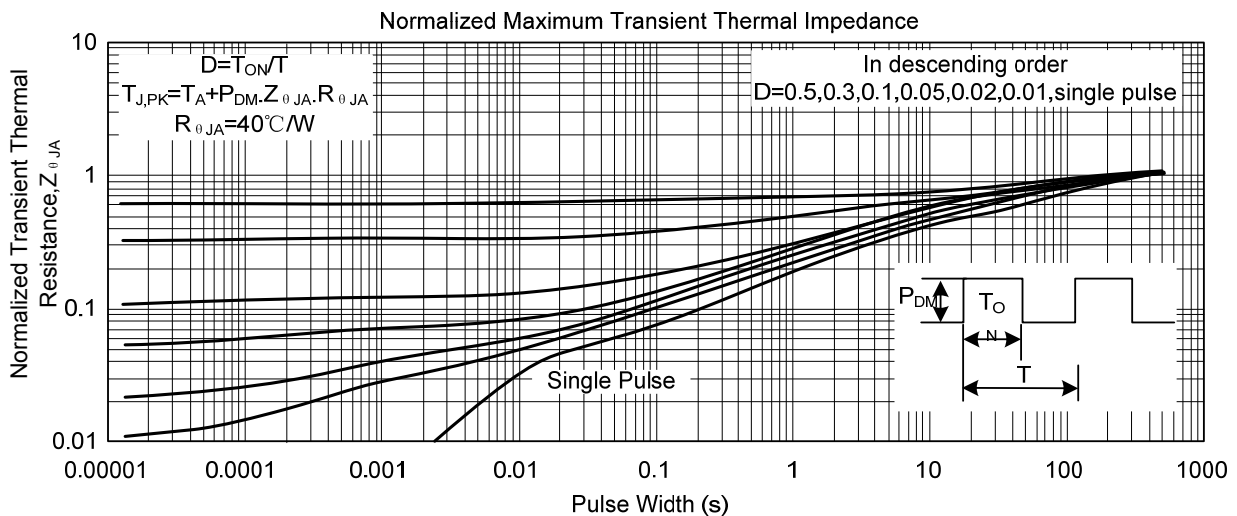
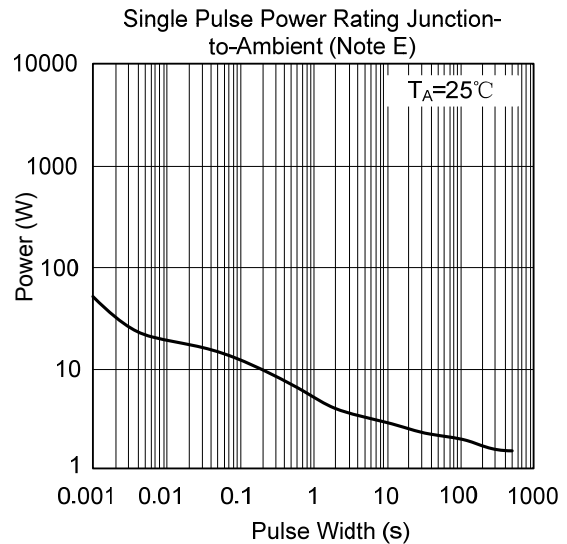
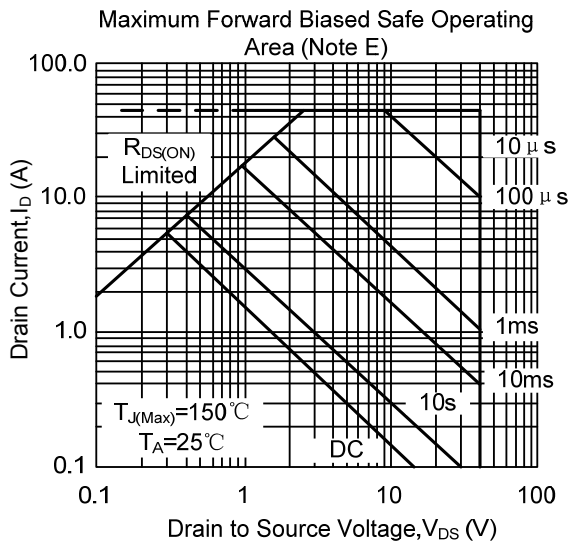
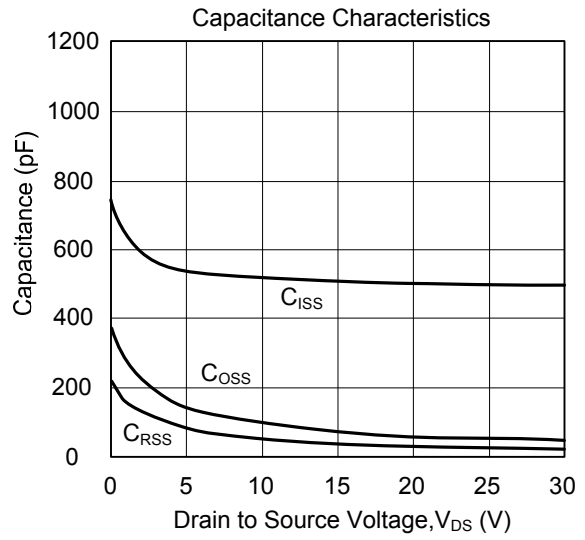
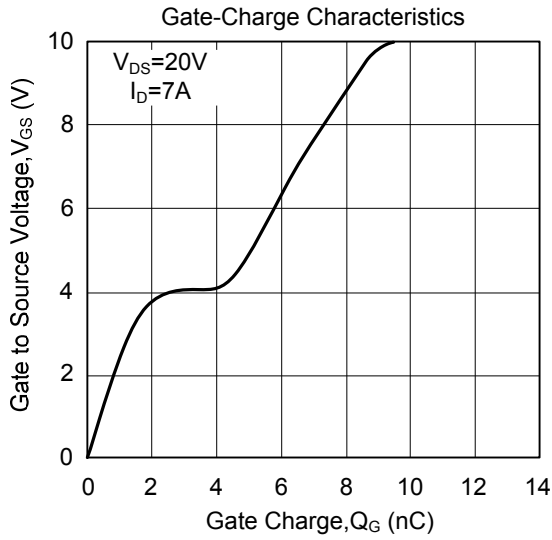


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



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