



UT4450

Power MOSFET

7A, 40V N-CHANNEL POWER MOSFET

DESCRIPTION

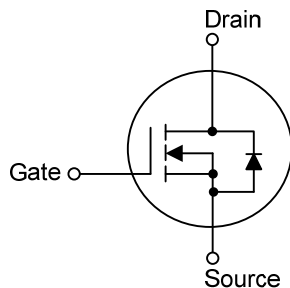
The UTC **UT4450** is an N-channel MOSFET. it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

FEATURES

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

SYMBOL

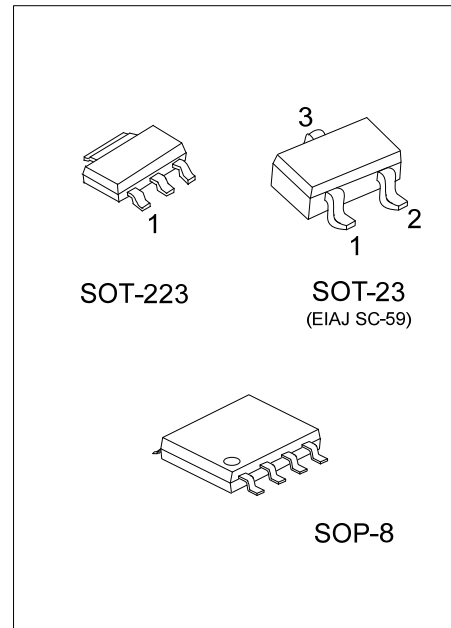


ORDERING INFORMATION

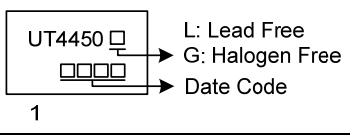
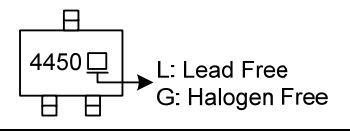
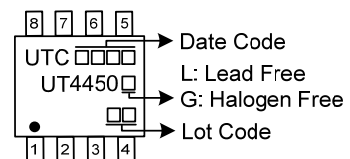
Ordering Number		Package	Pin Assignment								Packing	
Lead Free	Halogen Free		1	2	3	4	5	6	7	8		
UT4450L-AA3-R	UT4450G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	-	Tape Reel
UT4450L-AE3-R	UT4450G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	-	Tape Reel
UT4450L-S08-R	UT4450G-S08-R	SOP-8	S	S	S	G	D	D	D	D	D	Tape Reel

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

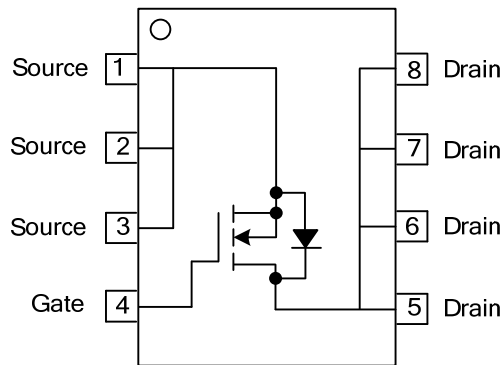
<p>UT4450G-AA3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-23, AE3: SOT-23, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

PACKAGE	MARKING
SOT-223	
SOT-23	
SOP-8	

PIN CONFIGURATION




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■ 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

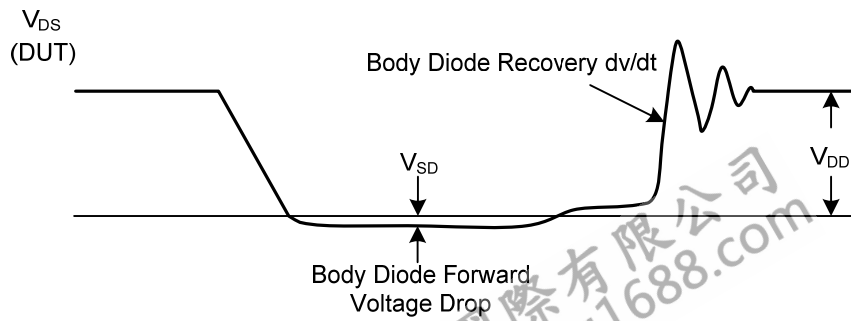
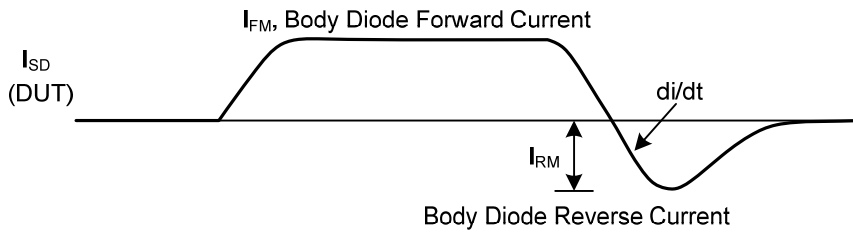
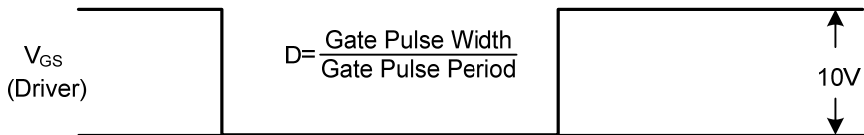
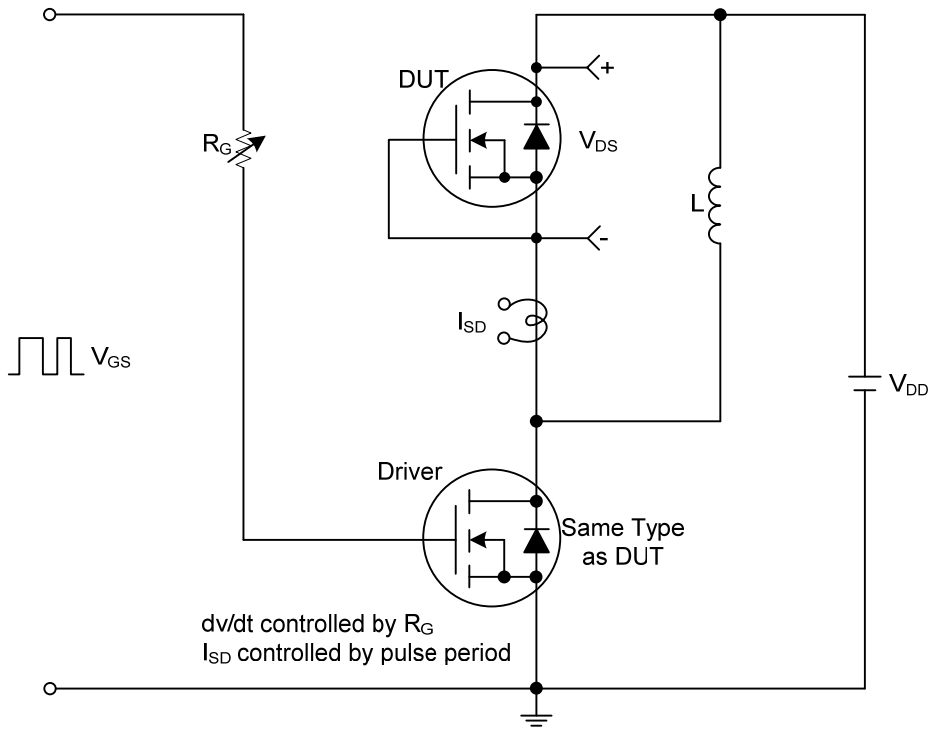
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	180	$^\circ\text{C/W}$
	SOT-23		325	$^\circ\text{C/W}$
	SOP-8		90 (Note)	$^\circ\text{C/W}$
Junction to Case	SOT-223	θ_{JC}	62.5	$^\circ\text{C/W}$
	SOT-23		125	$^\circ\text{C/W}$
	SOP-8		40.3 (Note)	$^\circ\text{C/W}$

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

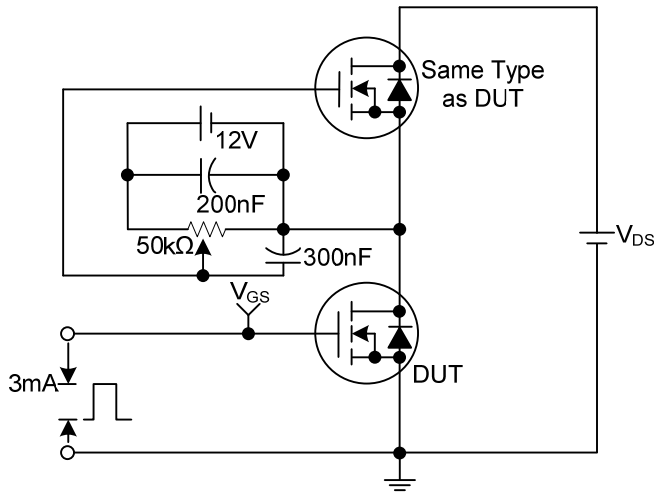
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	40			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=7.0\text{A}$			30	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=5.0\text{A}$			38	$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=20\text{V}$, $f=1.0\text{MHz}$		516		pF
Output Capacitance	C_{OSS}			82		pF
Reverse Transfer Capacitance	C_{RSS}			43		pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=20\text{V}$, $I_D=7.0\text{A}$		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	$t_{D(ON)}$	$V_{DS}=20\text{V}$, $V_{GS}=10\text{V}$, $R_{GEN}=3\Omega$, $R_L=2.8\Omega$		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}	$I_S=1.0\text{A}$, $V_{GS}=0\text{V}$			1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=7.0\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		18		ns
Body Diode Reverse Recovery Charge	Q_{rr}				10	

■ TEST CIRCUITS AND WAVEFORMS

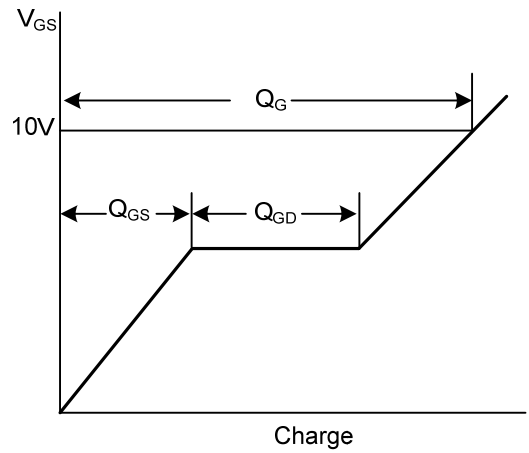


Peak Diode Recovery dv/dt Test Circuit and Waveforms

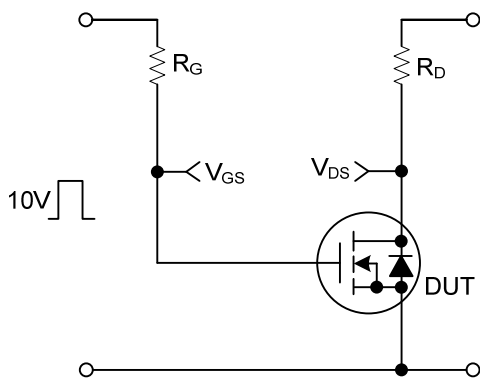
TEST CIRCUITS AND WAVEFORMS



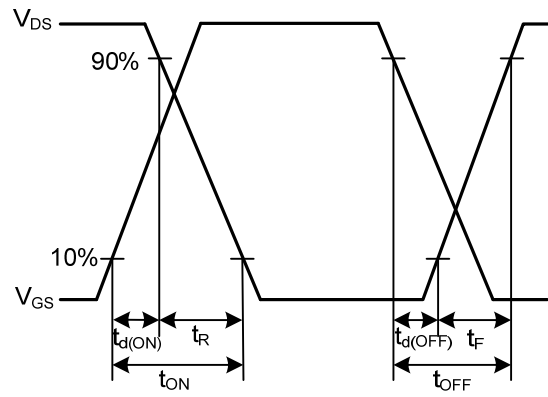
Gate Charge Test Circuit



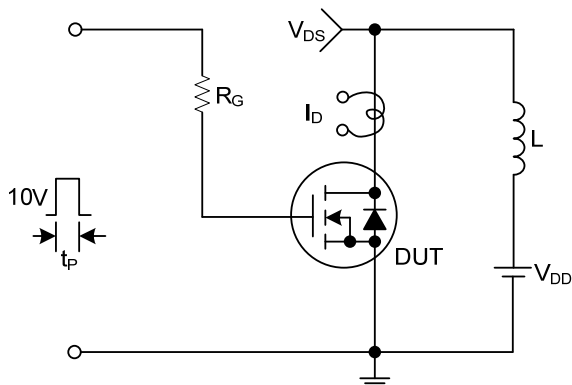
Gate Charge Waveforms



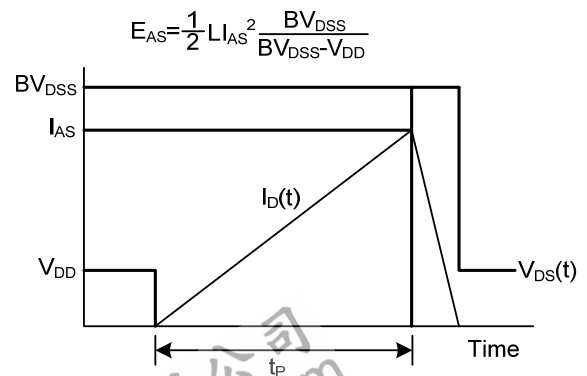
Resistive Switching Test Circuit



Resistive Switching Waveforms

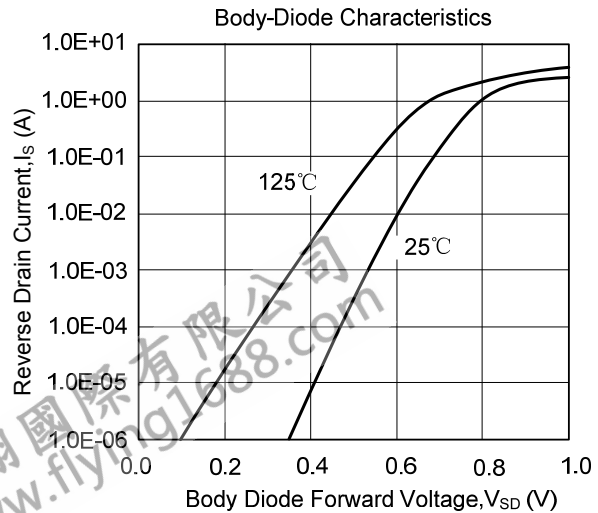
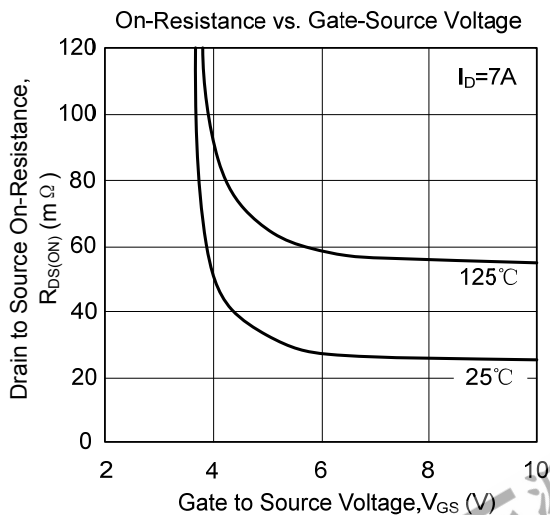
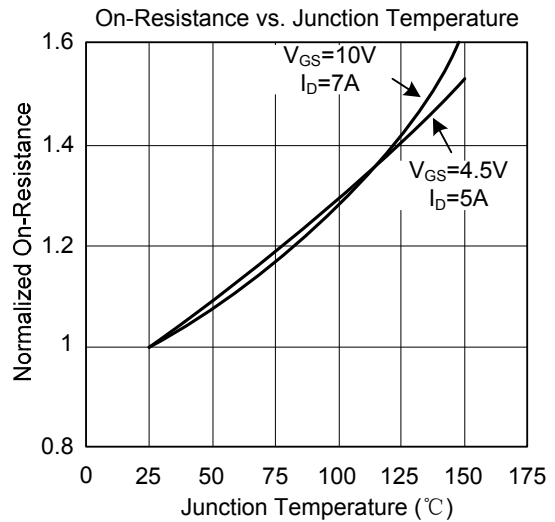
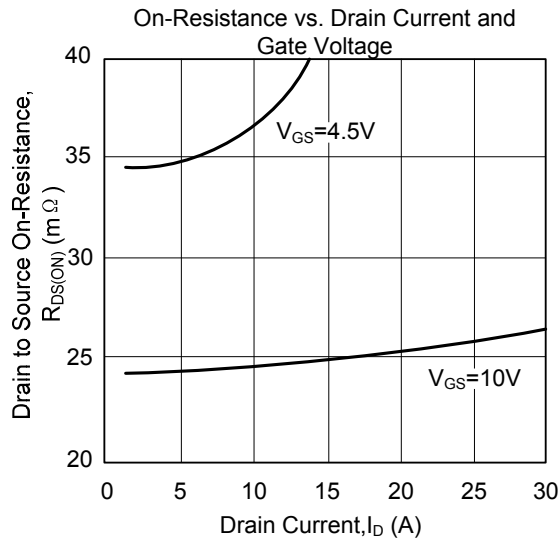
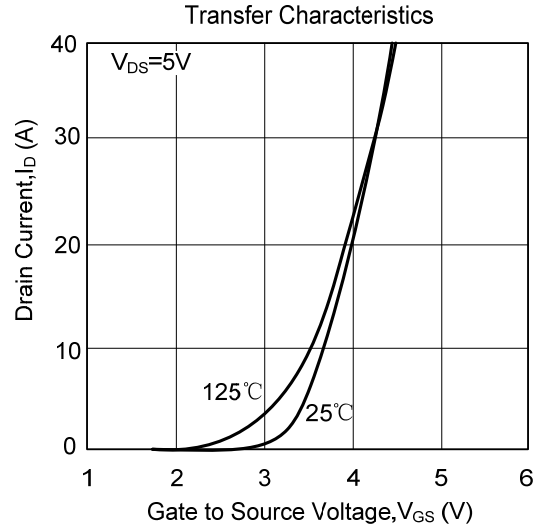
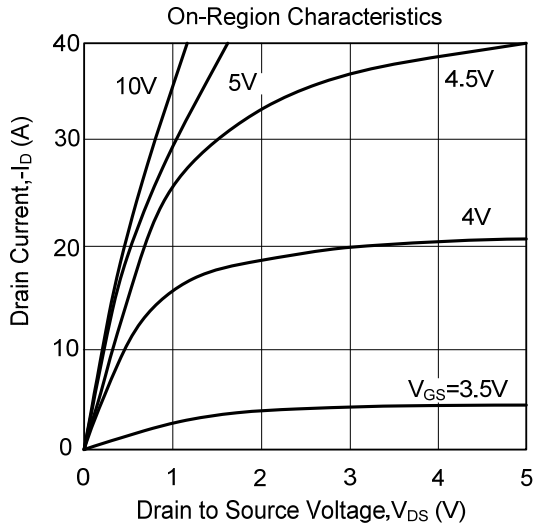


Unclamped Inductive Switching Test Circuit

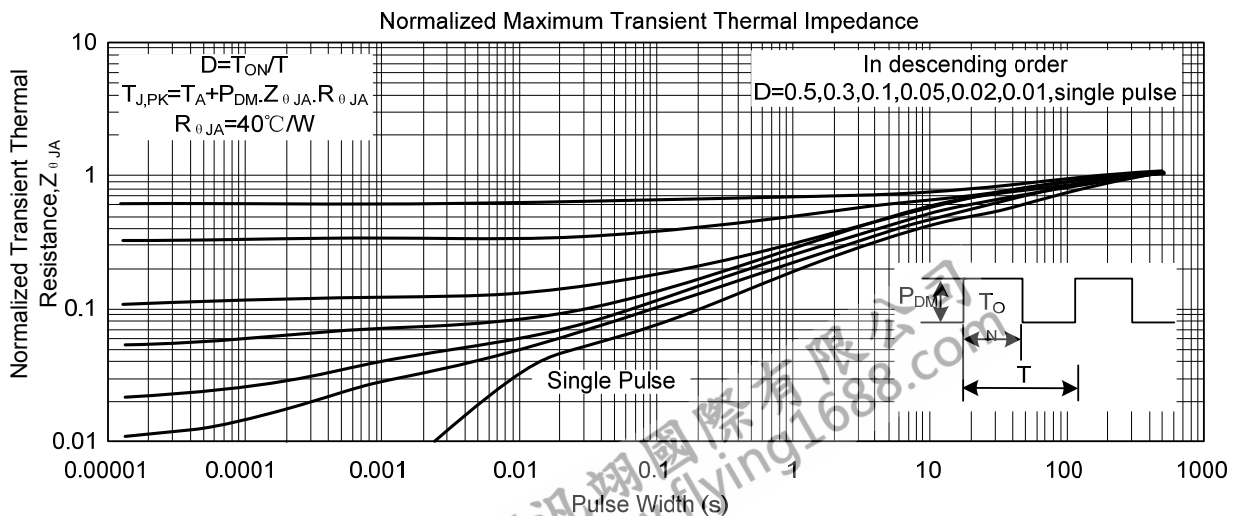
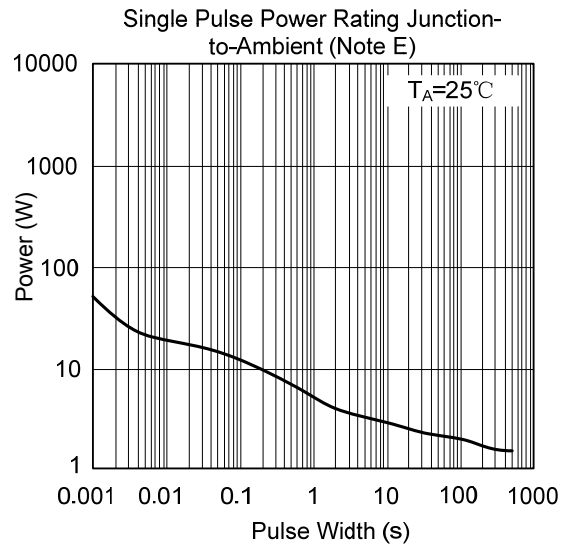
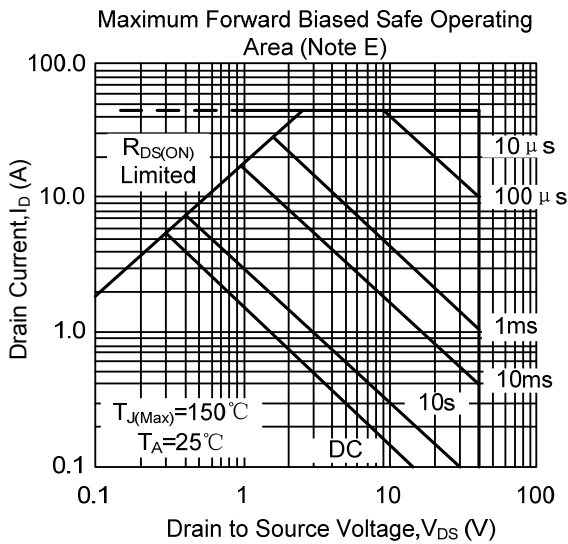
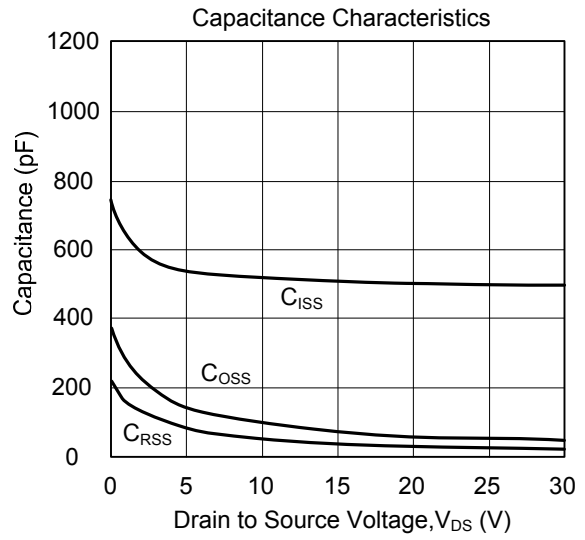
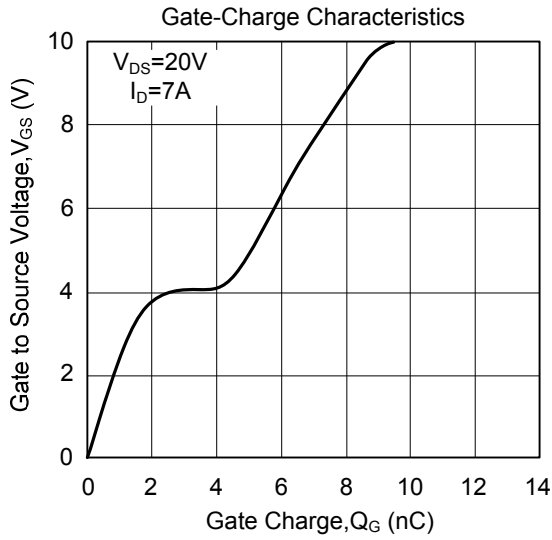


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



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