



UT4450

Power MOSFET

7A, 40V N-CHANNEL POWER MOSFET

DESCRIPTION

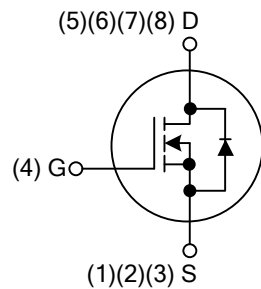
The UTC **UT4450** is an N-channel MOSFET. it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

FEATURES

- * $R_{DS(ON)} < 30m\Omega$ @ $V_{GS}=10V$, $I_D=7A$
 $R_{DS(ON)} < 38m\Omega$ @ $V_{GS}=4.5V$, $I_D=5A$
- * High switching speed
- * Low gate charge

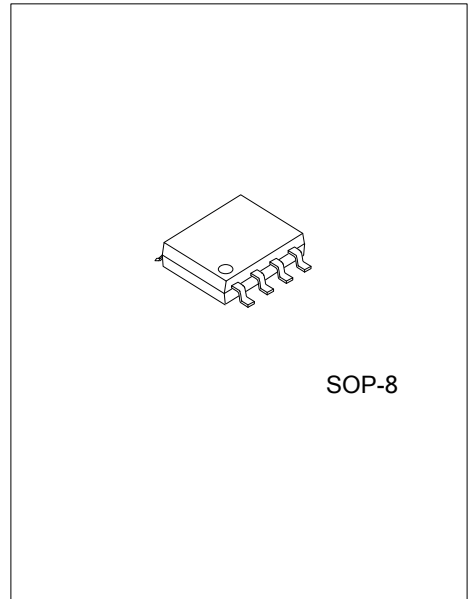
SYMBOL



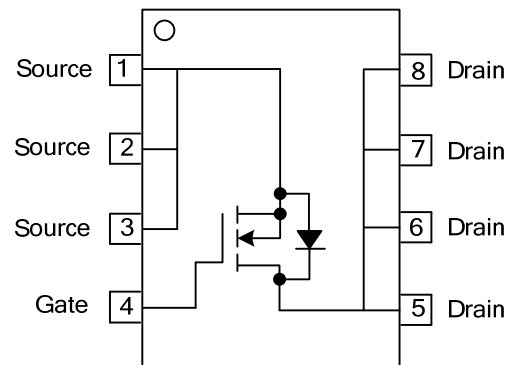
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UT4450L-S08-R	UT4450G-S08-R	SOP-8	Tape Reel
UT4450L-S08-T	UT4450G-S08-T	SOP-8	Tube

UT4450L-S08-R	(1)Packing Type	(1) R: Tape Reel, T: Tube
	(2)Package Type	(2) S08: SOP-8
	(3)Lead Free	(3) L: Lead Free, G: Halogen Free



■ PIN CONFIGURATION



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	40	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	T _A =25°C	I _D	7	A
		T _A =70°C		5.5	A
	Pulsed (Note 1)		I _{DM}	45	A
Avalanche Current (Note 1)			I _{AS}	14	A
Avalanche Energy	L=0.1mH (Note 1)		E _{AS}	10	mJ
Power Dissipation (Note 2)	T _A =25°C		P _D	3.1	W
	T _A =70°C			2	W
Junction Temperature			T _J	-55~+150	°C
Storage Temperature Range			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 CHARACTERISTICS

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	$t \leq 10\text{s}$ (Note 3)	θ_{JA}		31	40	$^\circ\text{C/W}$
	Steady-State (Note 3, 4)			59	75	$^\circ\text{C/W}$

Notes: 1. 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 $T_J=25^\circ\text{C}$.

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

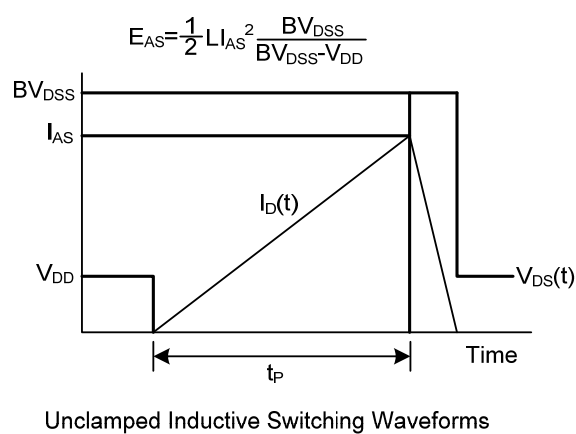
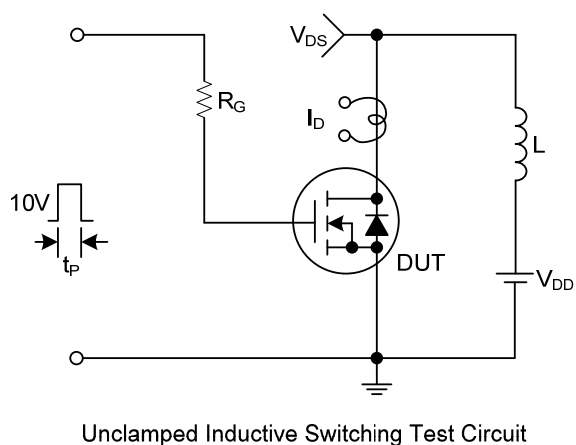
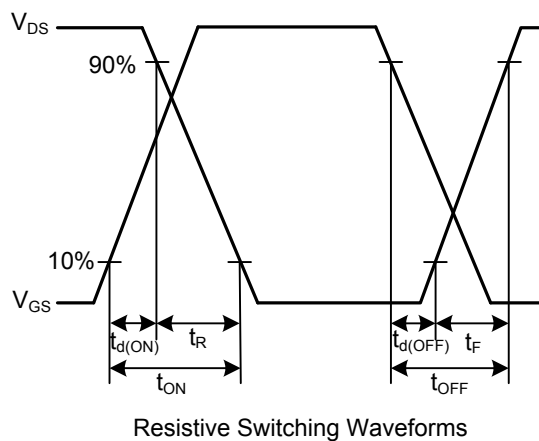
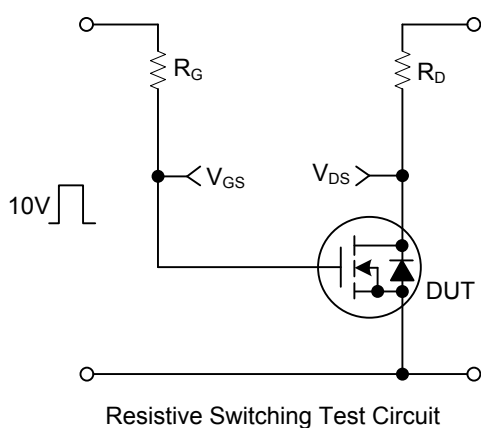
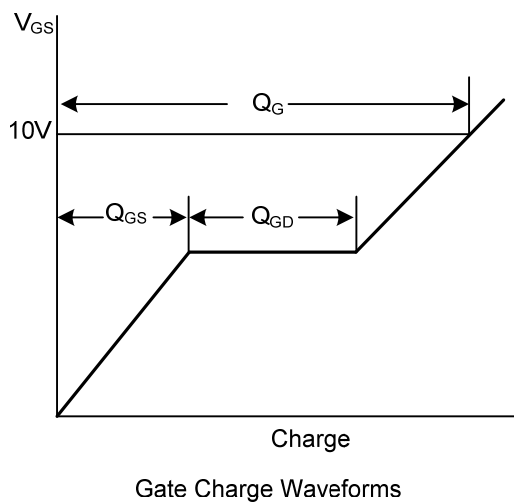
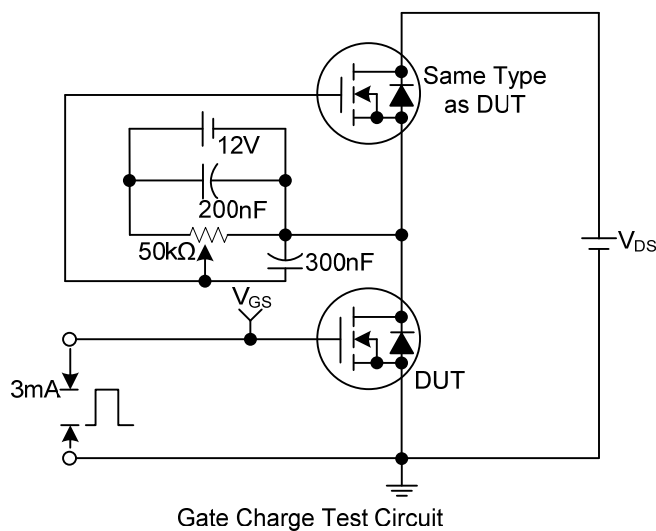
3. The device is measured that mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

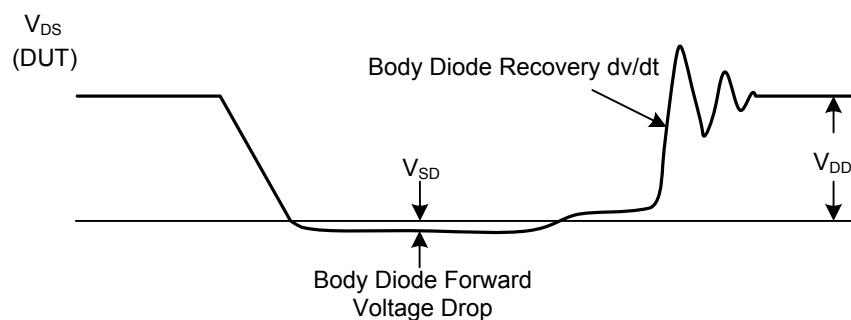
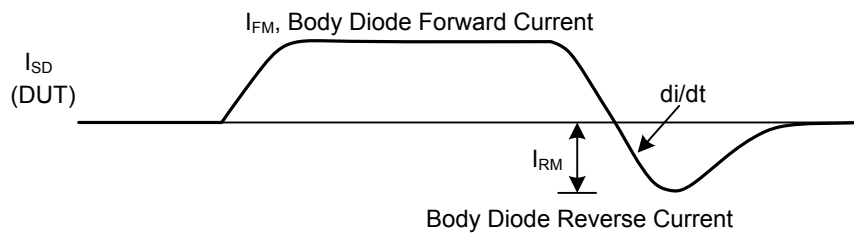
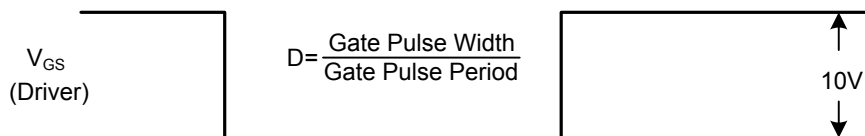
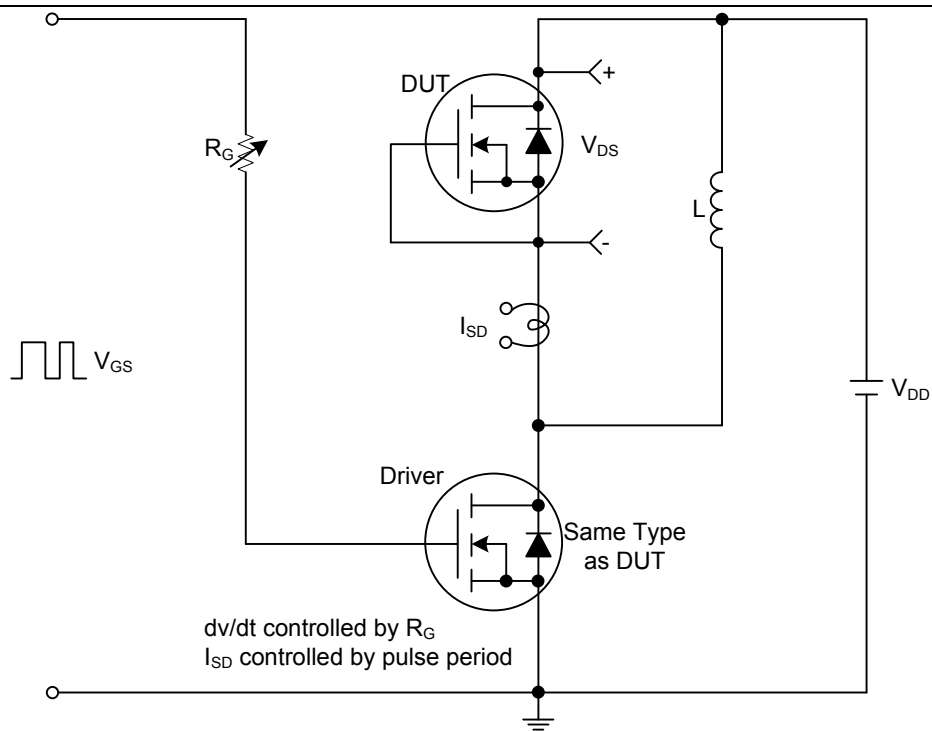
4. The θ_{JA} is the sum of the thermal impedance from junction to lead θ_{JL} and lead to ambient.

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

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			+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	1.7	2.5	3	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =7A		24	30	mΩ
			V _{GS} =4.5V, I _D =5A		30	38	mΩ
Forward Transconductance		g _{FS}	V _{DS} =5V, I _D =7A		30		S
On State Drain Current		I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	45			A
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
Gate Resistance		R _G	V _{GS} =0V, V _{DS} =0V, f=1MHz		4.6		Ω
SWITCHING PARAMETERS (Note 2)							
Total Gate Charge		Q _G	V _{GS} =4.5V, V _{DS} =20V, I _D =7A		4.3	7	nC
Total Gate Charge		Q _G	V _{GS} =10V, V _{DS} =20V, I _D =7A		8.9	13	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 =1A, V _{GS} =0V		0.76	1	V
Body Diode Reverse Recovery Time		t _{RR}	I _F =7A, dI/dt=100A/μs		18		ns
Body Diode Reverse Recovery Charge		Q _{RR}			10		nC

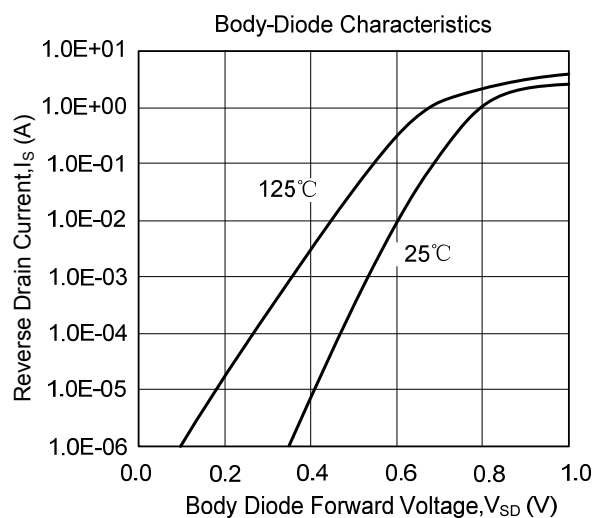
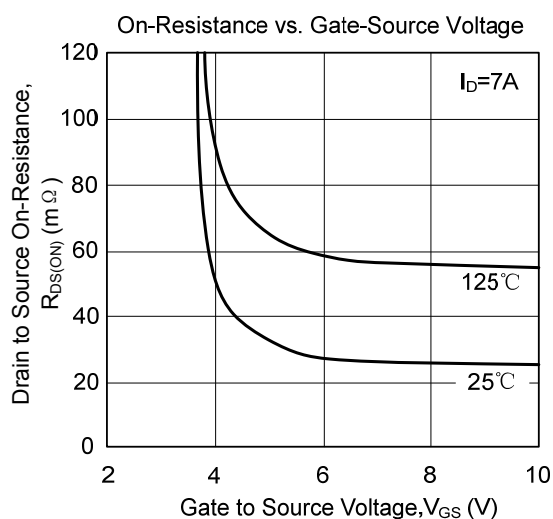
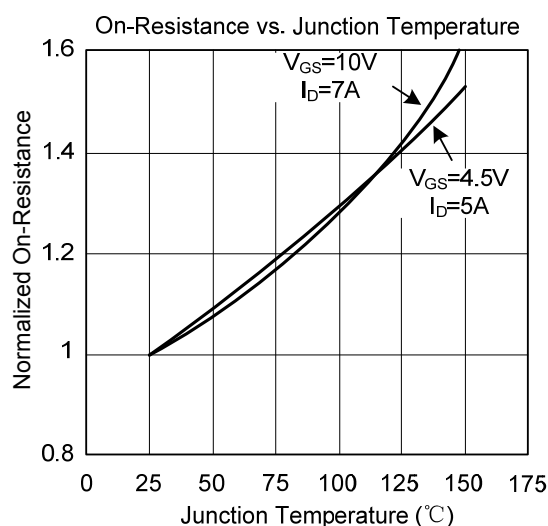
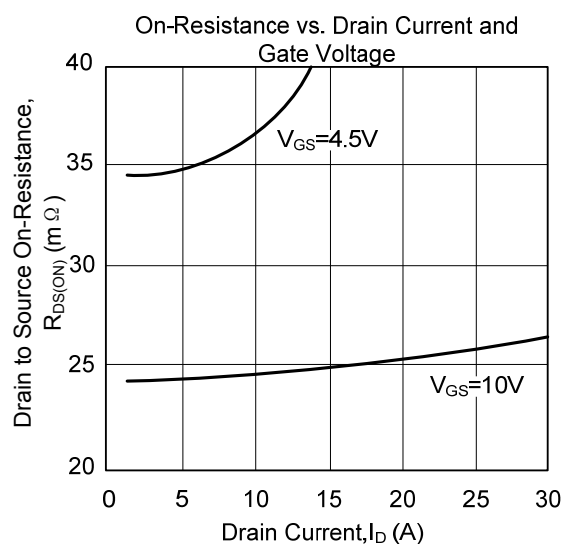
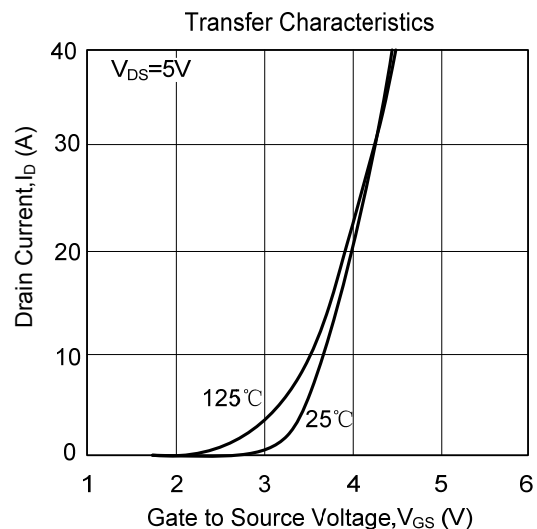
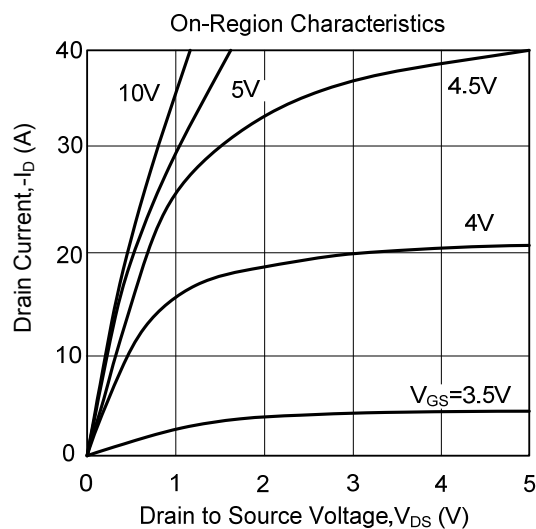
■ TEST CIRCUITS AND WAVEFORMS



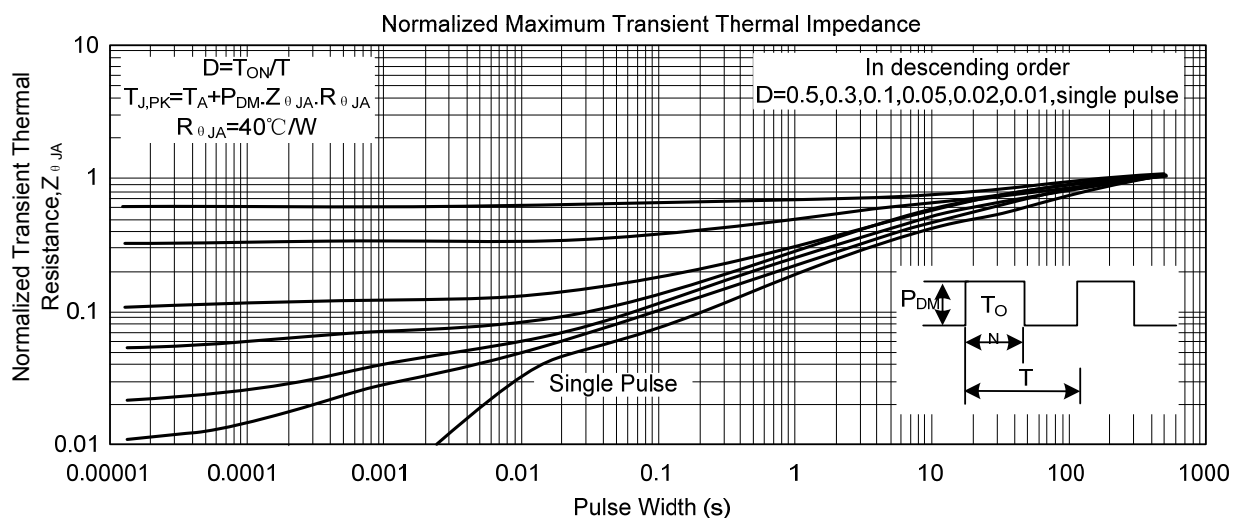
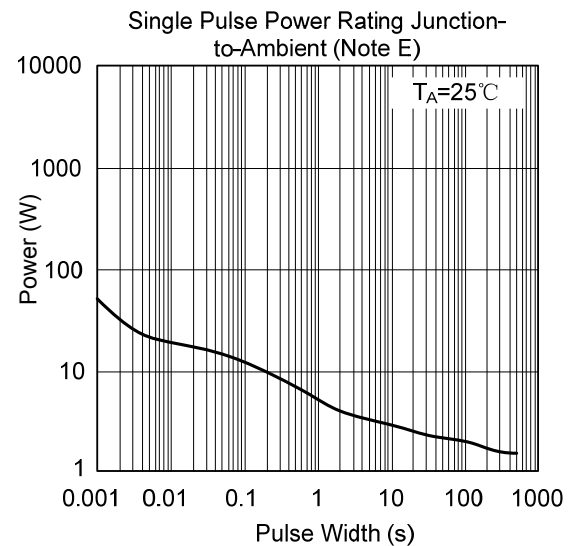
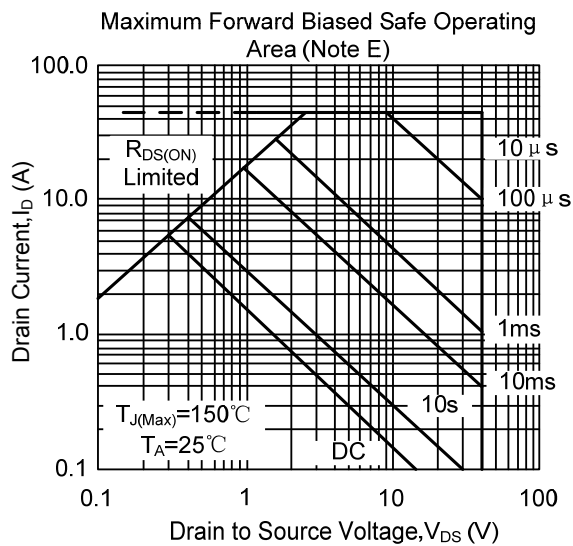
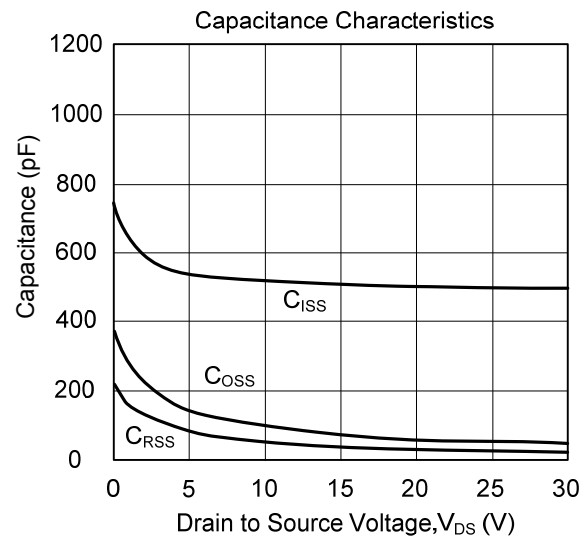
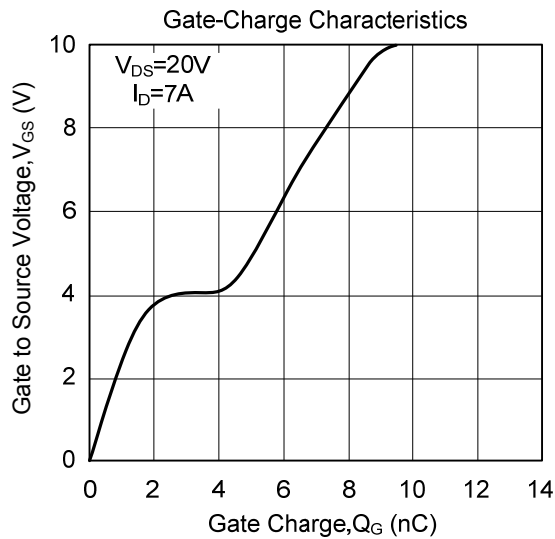


Peak Diode Recovery dv/dt Test Circuit and Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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