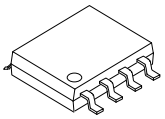
7.0A, 40V N-CHANNEL POWER MOSFET



SOP-8

■ DESCRIPTION

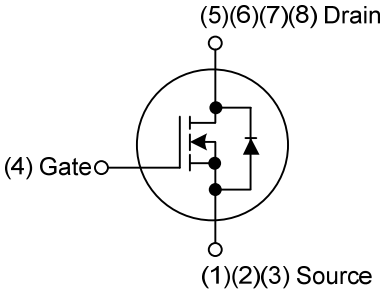
The UTC **UT4450** is an N-channel MOSFET. it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

■ FEATURES

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

■ SYMBOL



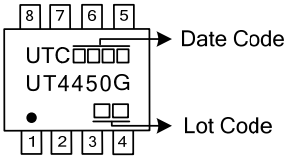
■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT4450G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

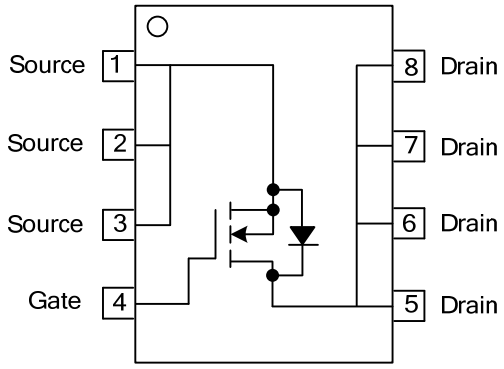
Note: Pin Assignment: G: Gate D: Drain S: Source

UT4450G-S08-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) S08: SOP-8
(3)Green Package	(3) G: Halogen Free and Lead Free

■ MARKING



■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°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°C	I_D	7	A
	Pulsed (Note 2)		I_{DM}	28	A
Avalanche Current (Note 2)			I_{AS}	14	A
Avalanche Energy	L=0.1mH (Note 2)		E_{AS}	10	mJ
Power Dissipation (Note 3)	T_A=25°C		P_D	3.1	W
Junction Temperature			T_J	+150	°C
Storage Temperature Range			T_{STG}	-55 ~ +150	°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 $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initialT_J=25°C.
3. Based on $T_{J(MAX)}$=150°C, using≤10s.

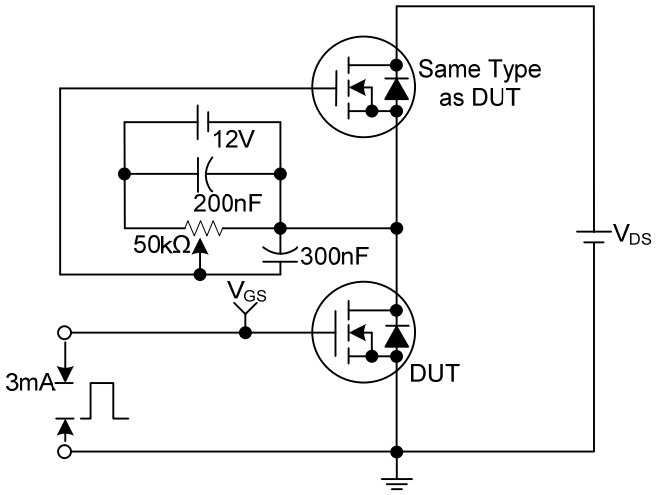
■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	40.3	°C/W

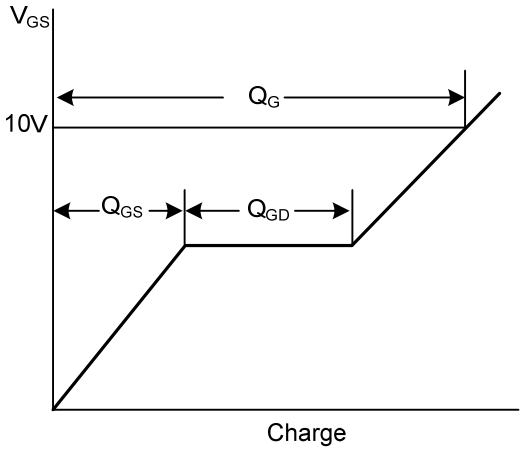
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

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			+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	1.0		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		nC

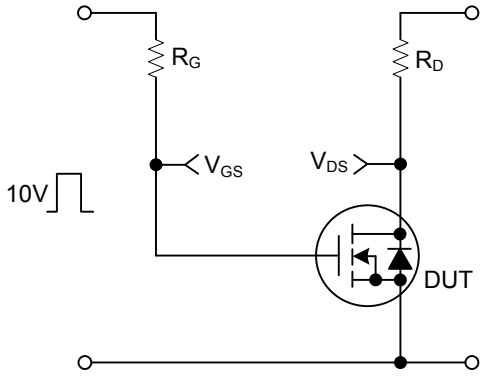
■ TEST CIRCUITS AND WAVEFORMS



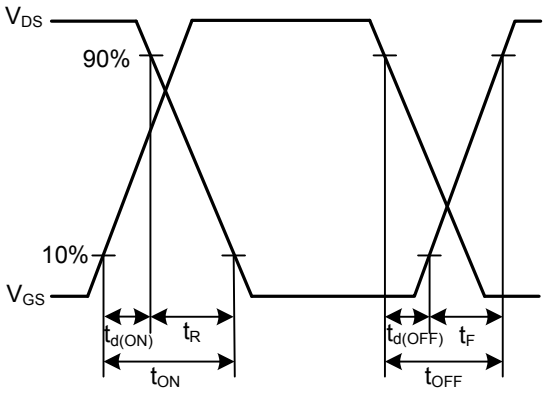
Gate Charge Test Circuit



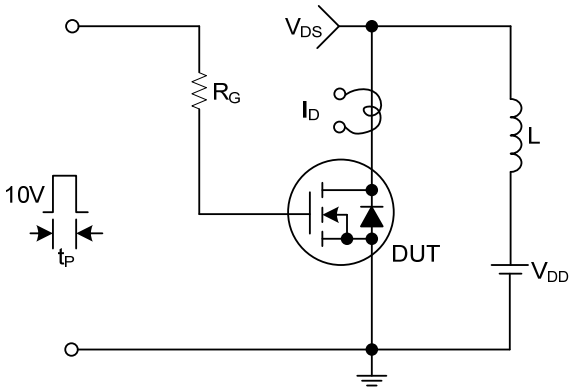
Gate Charge Waveforms



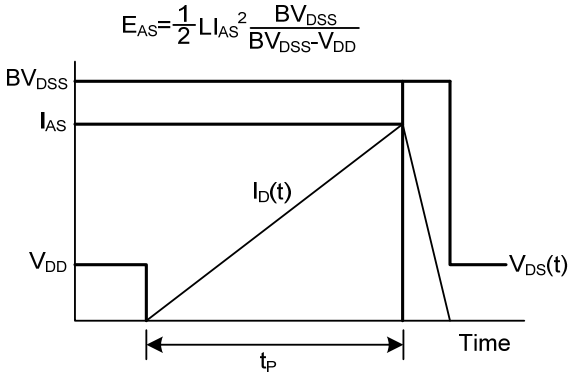
Resistive Switching Test Circuit



Resistive Switching Waveforms

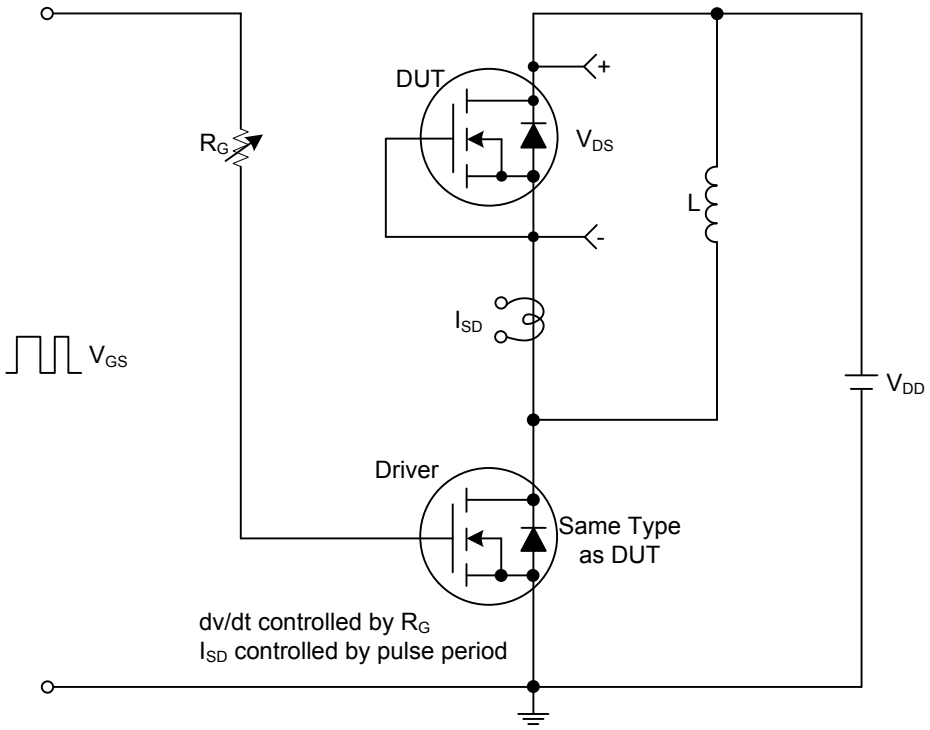


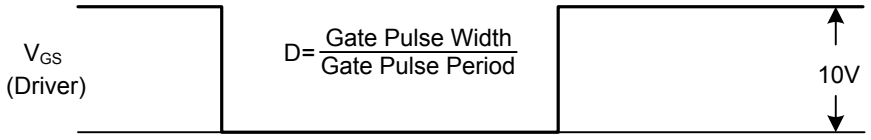
Unclamped Inductive Switching Test Circuit

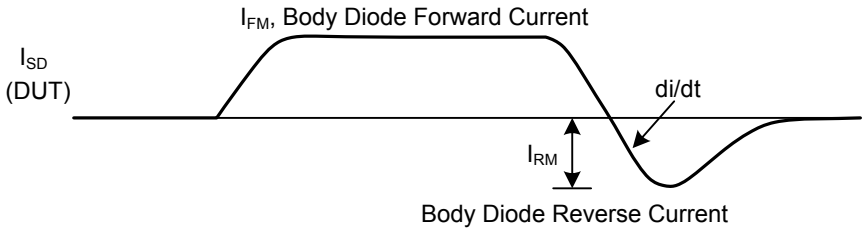


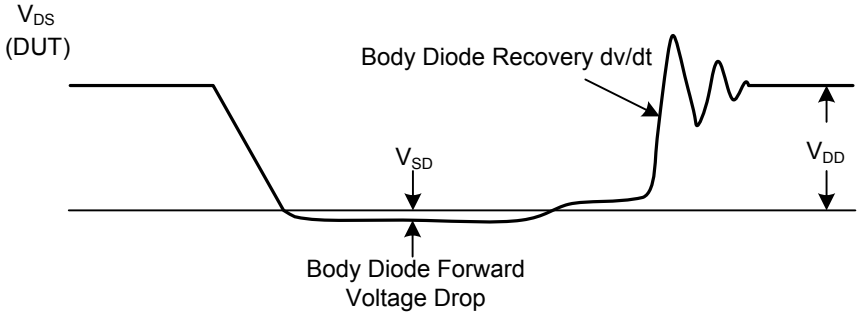
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)





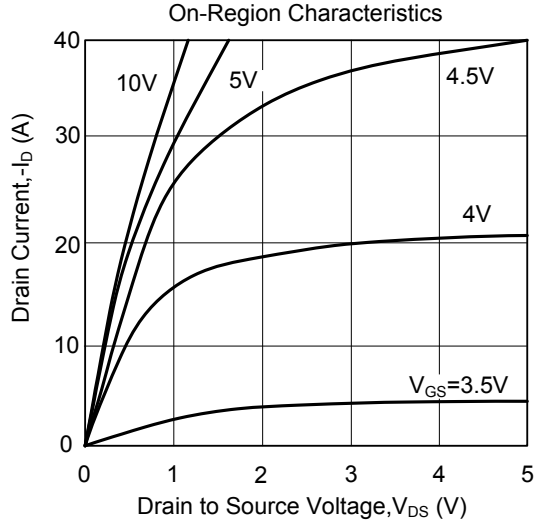




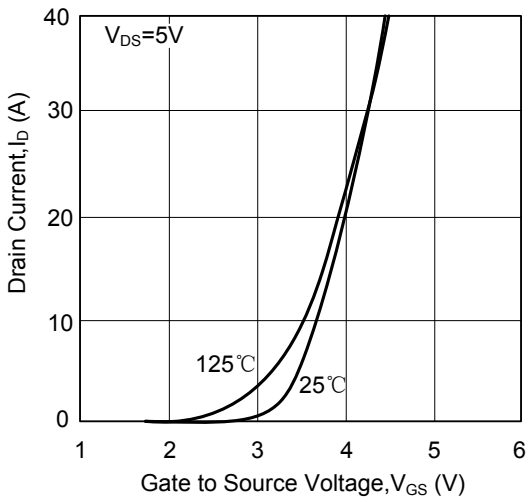
Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS

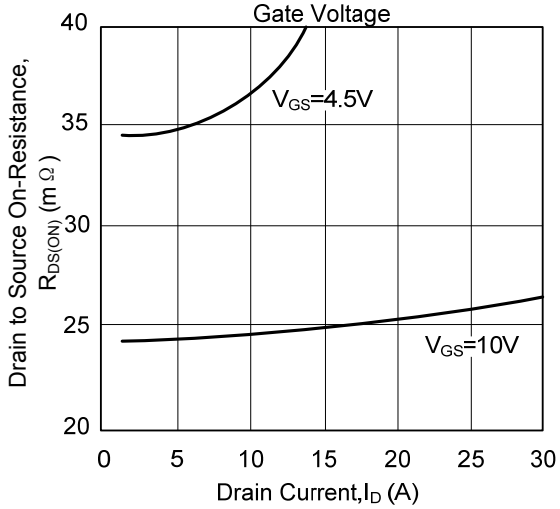
On-Region Characteristics



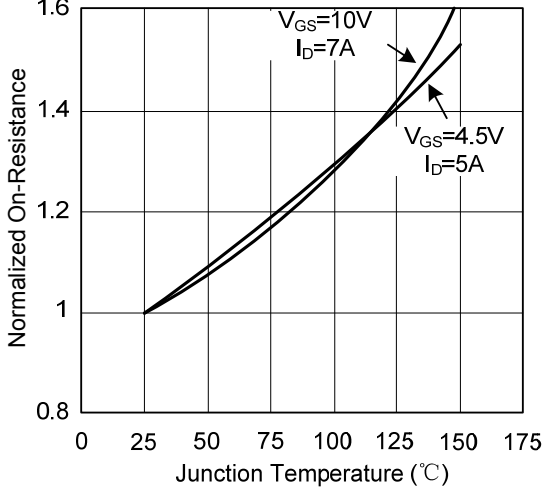
Transfer Characteristics



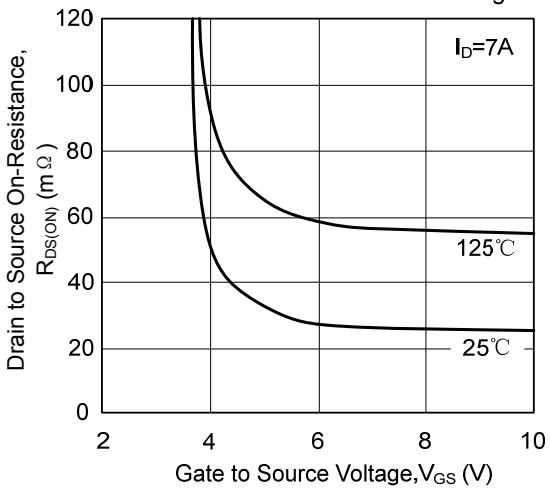
On-Resistance vs. Drain Current and Gate Voltage



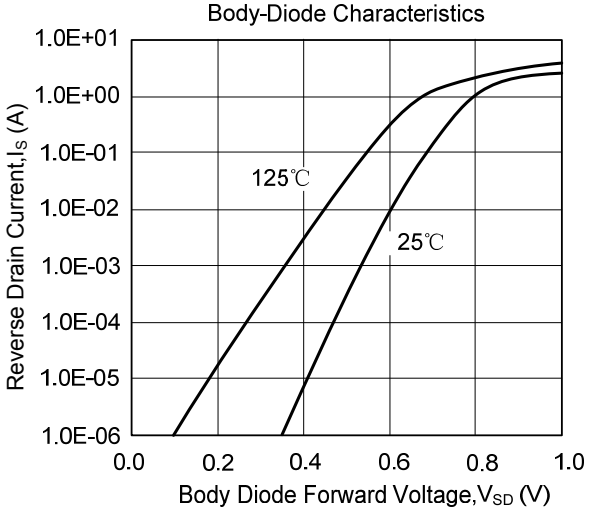
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage

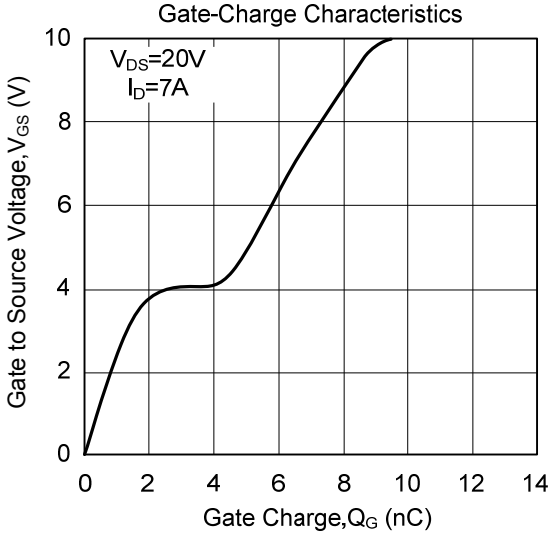


Body-Diode Characteristics

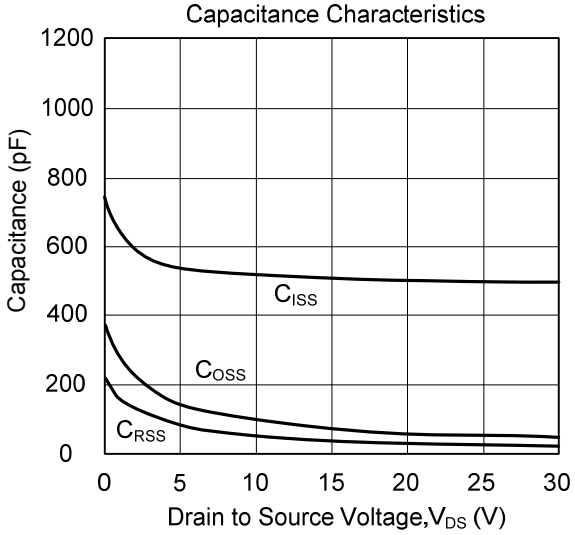


■ TYPICAL CHARACTERISTICS(Cont.)

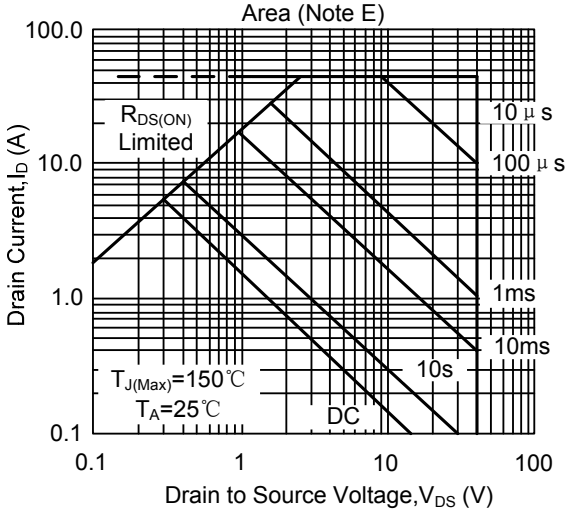
Gate-Charge Characteristics



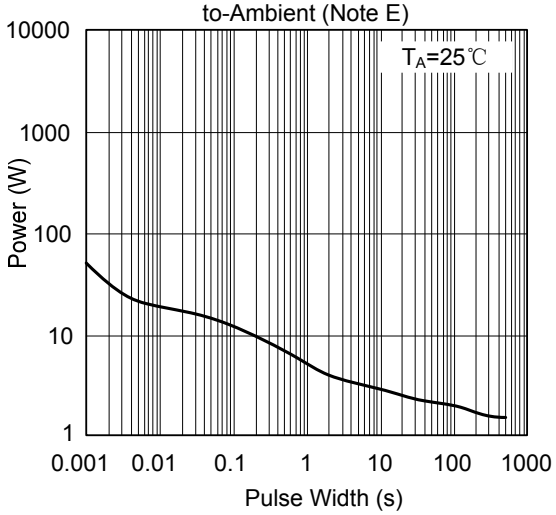
Capacitance Characteristics



Maximum Forward Biased Safe Operating Area (Note E)



Single Pulse Power Rating Junction-to-Ambient (Note E)



Normalized Maximum Transient Thermal Impedance