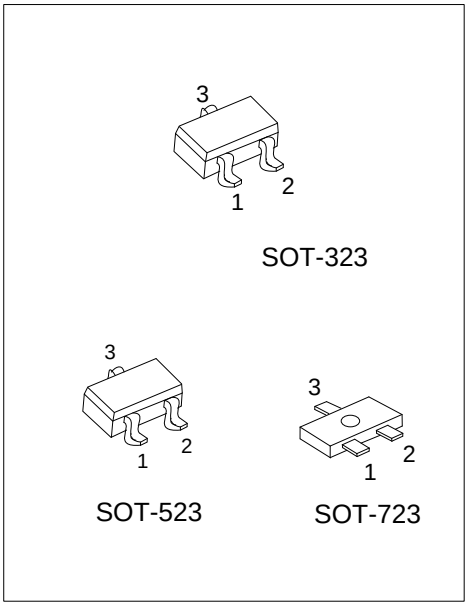
UTT08N02Z-F

Power MOSFET

800mA, 20V N-CHANNEL POWER MOSFET



■ DESCRIPTION

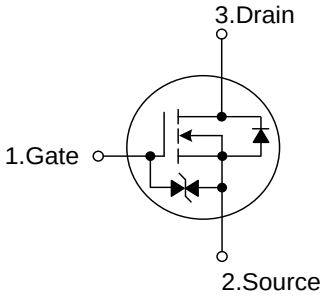
UTC **UTT08N02Z-F** is a N-Channel enhancement mode power field effect transistors are using trench DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 300 mΩ @ V_{GS}=4.5V, I_D=0.5A
* Suit for 1.5V gate drive applications
* Improved dv/dt capability
* Fast switching
* Green device available

■ SYMBOL



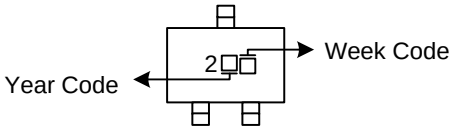
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT08N02ZL-AL3-R	UTT08N02ZG-AL3-R	SOT-323	G	S	D	Tape Reel
UTT08N02ZL-AN3-R	UTT08N02ZG-AN3-R	SOT-523	G	S	D	Tape Reel
UTT08N02ZL-AQ3-R	UTT08N02ZG-AQ3-R	SOT-723	G	S	D	Tape Reel

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

UTT08N02ZG-AL3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AL3: SOT-323, AN3: SOT-523, AQ3: SOT-723 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	Continuous	I_D	800	mA
	Pulsed (Note 2)	I_{DM}	3.2	A
Power Dissipation	SOT-323	P_D	260	mW
	SOT-523		200	mW
	SOT-723		150	mW
Junction Temperature		T_J	+150	°C
Storage Temperature		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 maximum junction temperature.

■ THERMAL CHARACTERISTICS

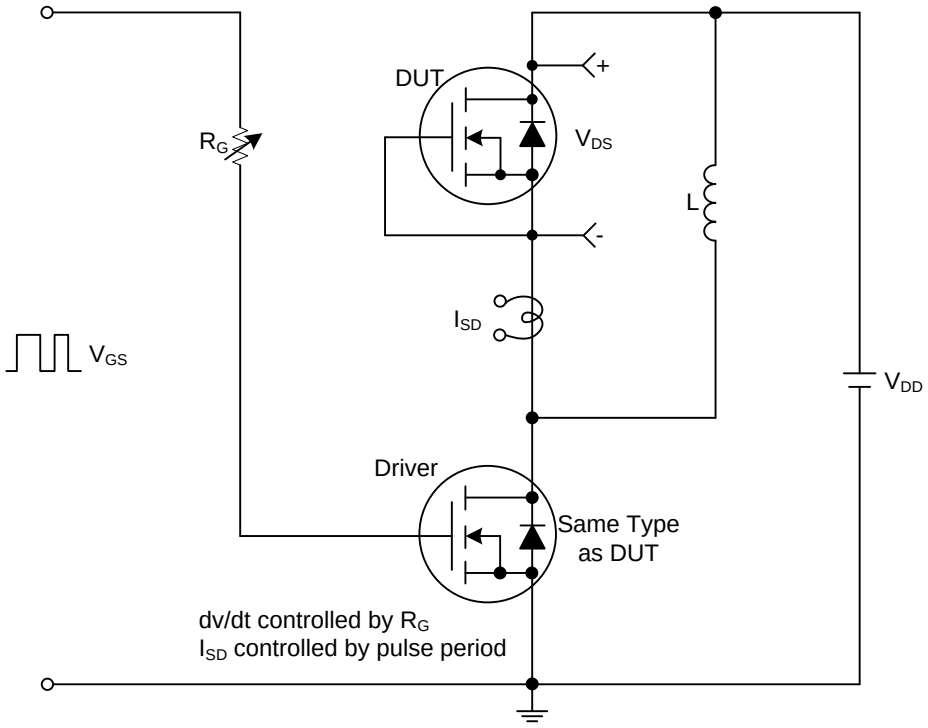
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-323	θ_{JA}	450	°C/W
	SOT-523		625	°C/W
	SOT-723		833	°C/W

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

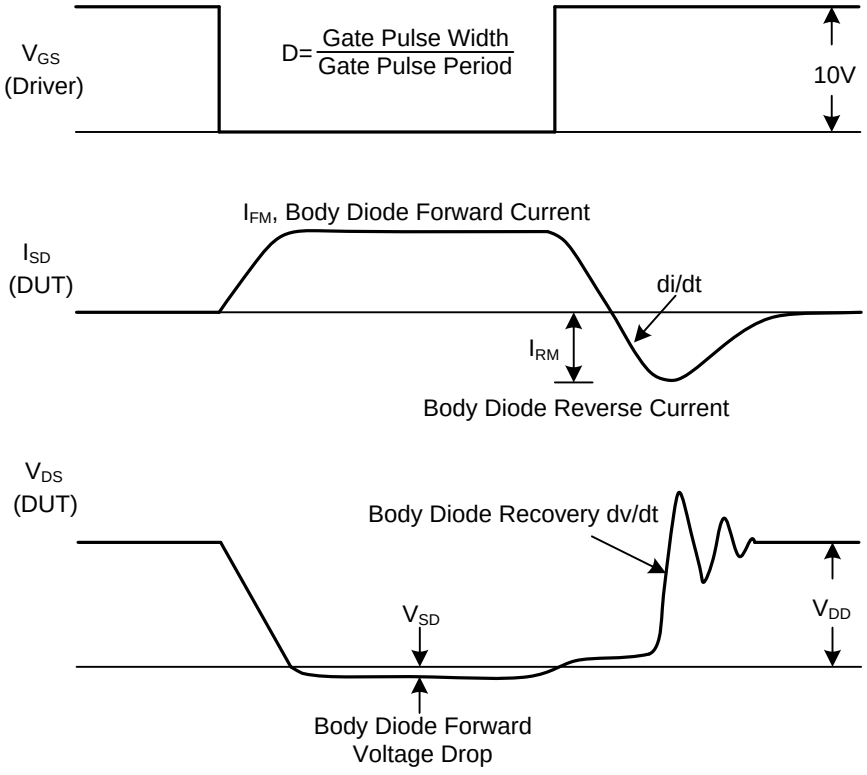
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V, T_J =25°C			1	μA
			V_{DS}=16V, V_{GS}=0V, T_J =125°C			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+8V, V_{DS}=0V			20	μA
	Reverse		V_{GS}=-8V, V_{DS}=0V			-20	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.3	0.5	0.85	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.5A		200	300	mΩ
			V_{GS}=2.5V, I_D=0.4A		300	450	mΩ
			V_{GS}=1.8V, I_D=0.2A		500	700	mΩ
			V_{GS}=1.5V, I_D=0.1A		800	1200	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=10V, V_{GS}=0V, f=1.0MHz		38.2	75	pF
Output Capacitance		C_{OSS}			14.4	28	pF
Reverse Transfer Capacitance		C_{RSS}			6	12	pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A		1	2	nC
Gate to Source Charge		Q_{GS}			0.26	0.5	nC
Gate to Drain Charge		Q_{GD}			0.2	0.4	nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A, R_G=10Ω		5	10	ns
Rise Time		t_R			3.5	7	ns
Turn-off Delay Time		$t_{D(OFF)}$			14	28	ns
Fall-Time		t_F			6	12	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				0.8	A
Maximum Body-Diode Pulsed Current		I_{SM}				1.6	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=0.2A, V_{GS}=0V			1	V

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle≤2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



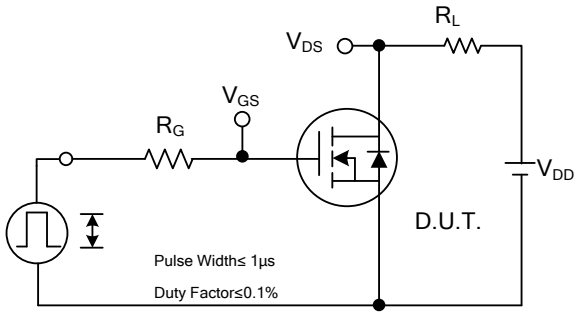
Peak Diode Recovery dv/dt Test Circuit



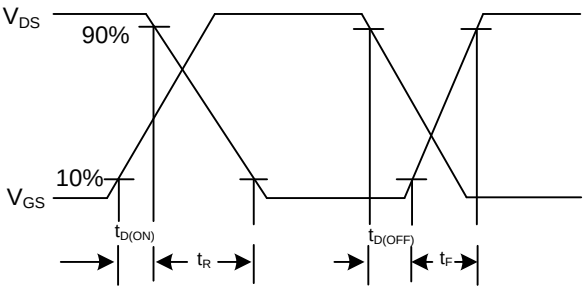
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

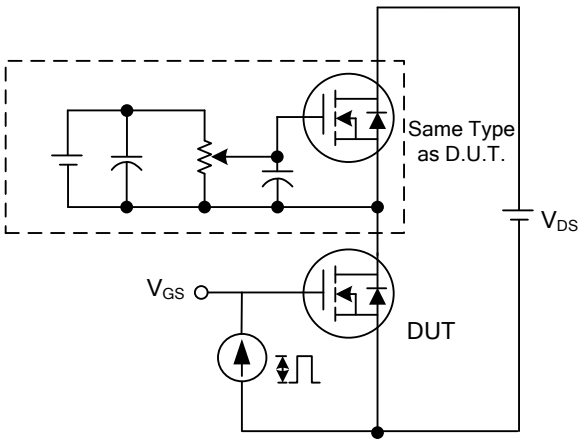
■ TEST CIRCUITS AND WAVEFORMS



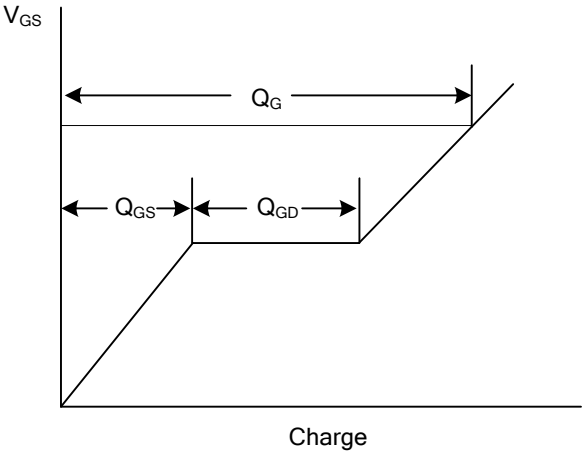
Switching Test Circuit



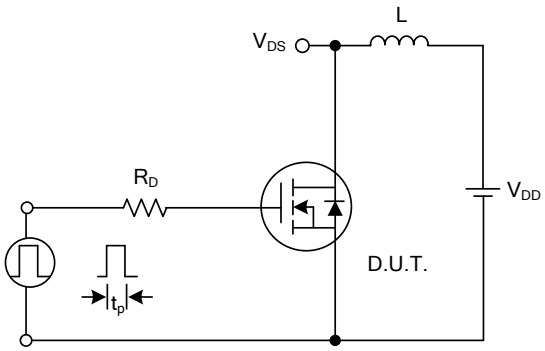
Switching Waveforms



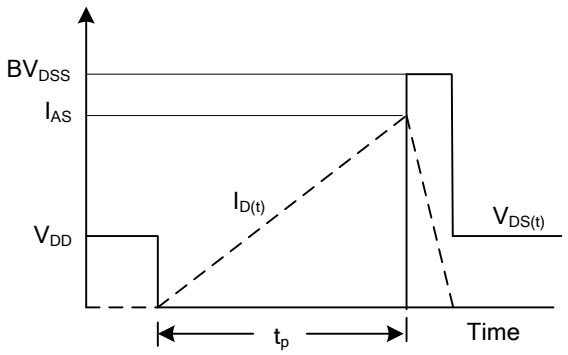
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

Fig.1 Continuous Drain Current vs. Case Temperature

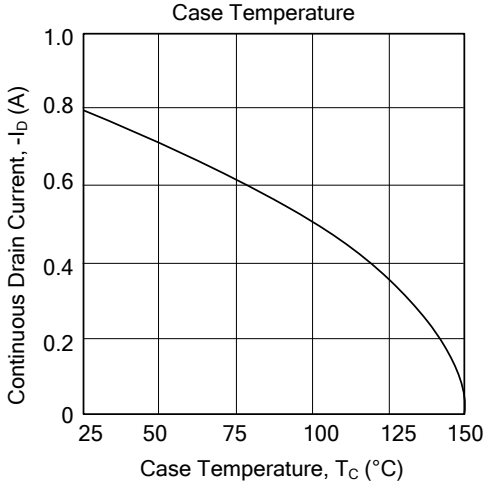


Fig.2 Normalized R_{DSON} vs. Junction Temperature

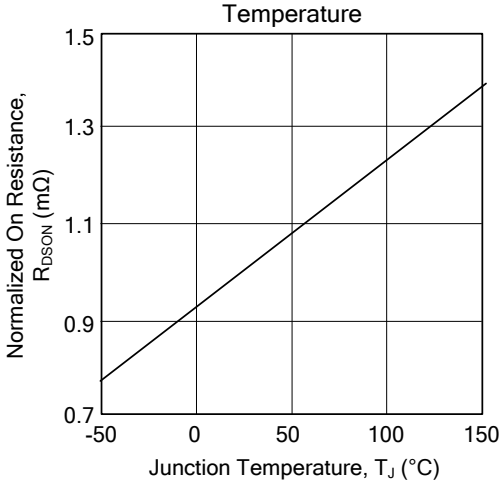


Fig.3 Normalized V_{th} vs. Junction Temperature

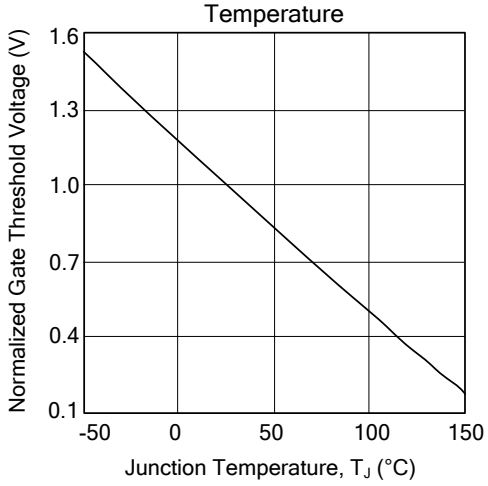


Fig.4 Gate Charge Waveform

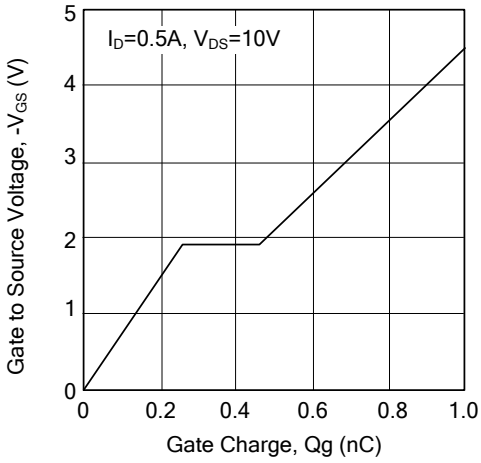


Fig.5 Normalized Transient Impedance

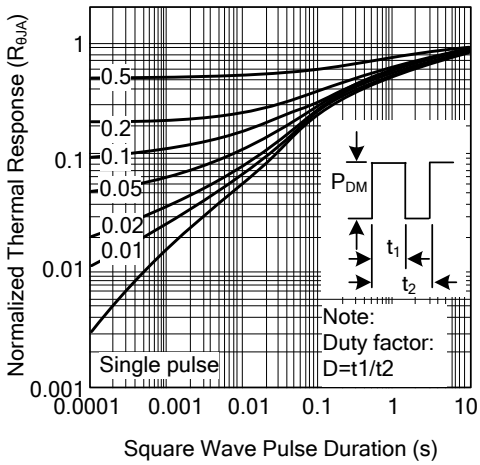
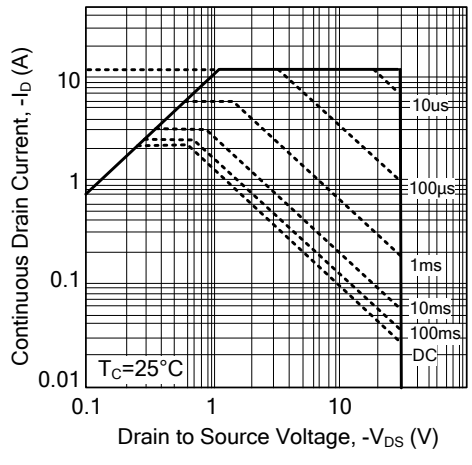


Fig.6 Maximum Safe Operation Area



■ TYPICAL CHARACTERISTICS (Cont.)