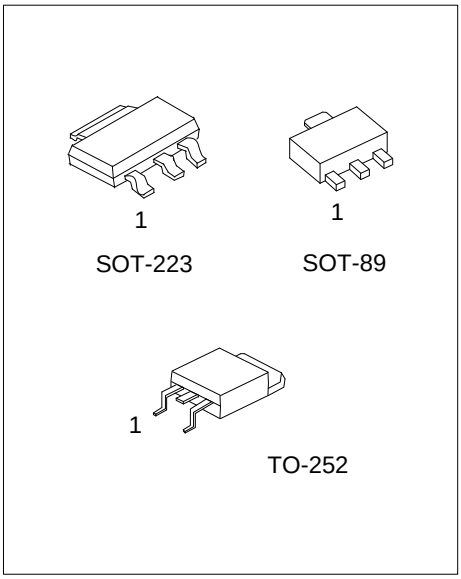
UTT4N10

Power MOSFET

3.5A, 100V N-CHANNEL TRENCHMOS LOGIC LEVEL FET



■ DESCRIPTION

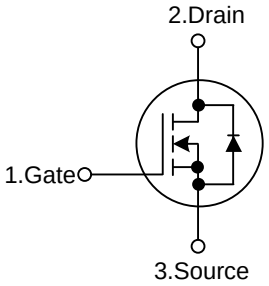
The UTC **UTT4N10** is an N-Channel Trench MOS Logic Level FET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance and low gate charge.

The UTC **UTT4N10** is suitable for consumer, computing and communications, etc.

■ FEATURES

* $R_{DS(ON)}$ ≤ 250 mΩ @ V_{GS}=5V, I_D=1.75A

■ SYMBOL



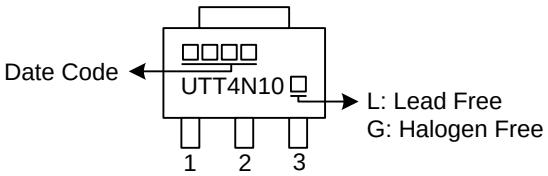
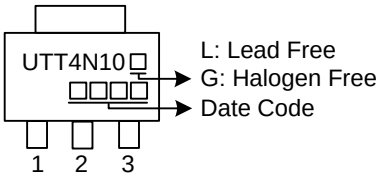
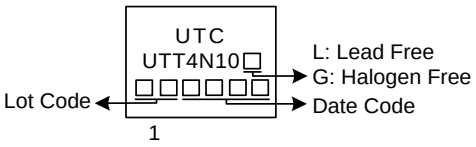
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT4N10L-AA3-R	UTT4N10G-AA3-R	SOT-223	G	D	S	Tape Reel
UTT4N10L-AB3-R	UTT4N10G-AB3-R	SOT-89	G	D	S	Tape Reel
UTT4N10L-TN3-R	UTT4N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT4N10G-AA3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AA3: SOT-223, AB3: SOT-89, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOT-89	
SOT-223	
TO-252	

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage	T_J≥25°C, T_J≤150°C		V_{DSS}	100	V
Drain-Gate Voltage	T_J≥25°C, T_J≤150°C, R_{GS}=20kΩ		V_{DGR}	100	V
Gate-Source Voltage			V_{GSS}	±16	V
Drain Current	Continuous	T_C=100°C, V_{GS}=5V	I_D	2.2	A
		T_C=25°C, V_{GS}=5V		3.5	A
	Pulsed	T_C=25°C, t_p≤10μs	I_{DM}	14	A
Non-Repetitive Avalanche Current	V_{GS}=5V, V_{DD}≤15V, R_{GS}=50Ω, Unclamped		I_{AS}	3.5	A
Non-Repetitive Avalanche Energy	V_{GS}=5V, V_{DD}≤15V, R_{GS}=50Ω, I_D=3.5A, Unclamped, t_p=0.2ms		E_{AR}	45	mJ
Power Dissipation		SOT-223	P_D	6	W
		SOT-89		3.5	W
		TO-252		32	W
Junction Temperature			T_J	-65 ~ +150	°C
Storage Temperature Range			T_{STG}	-65 ~ +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 DATA (NOTE)

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	°C/W
	SOT-89		180	°C/W
	TO-252		80	°C/W

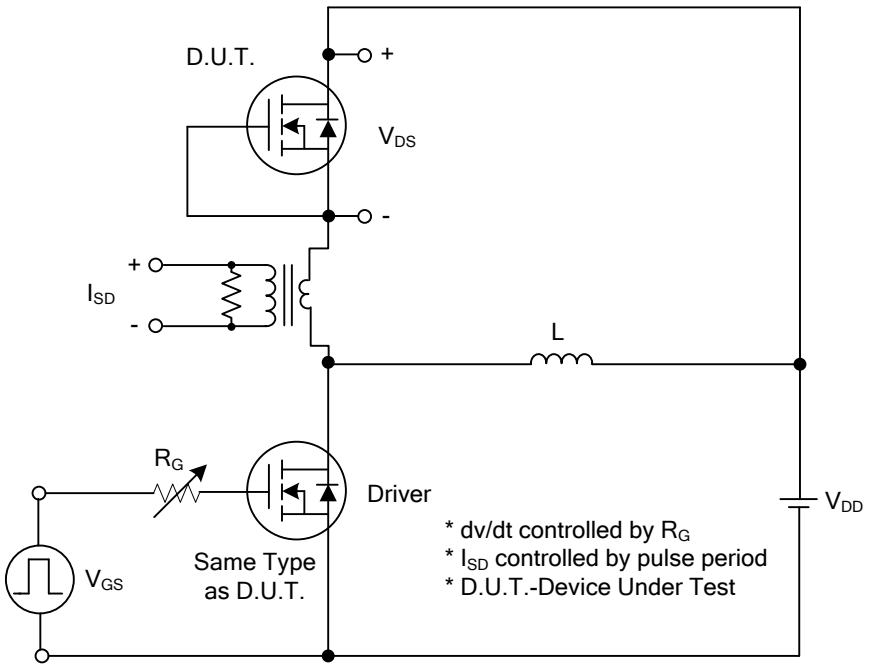
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS

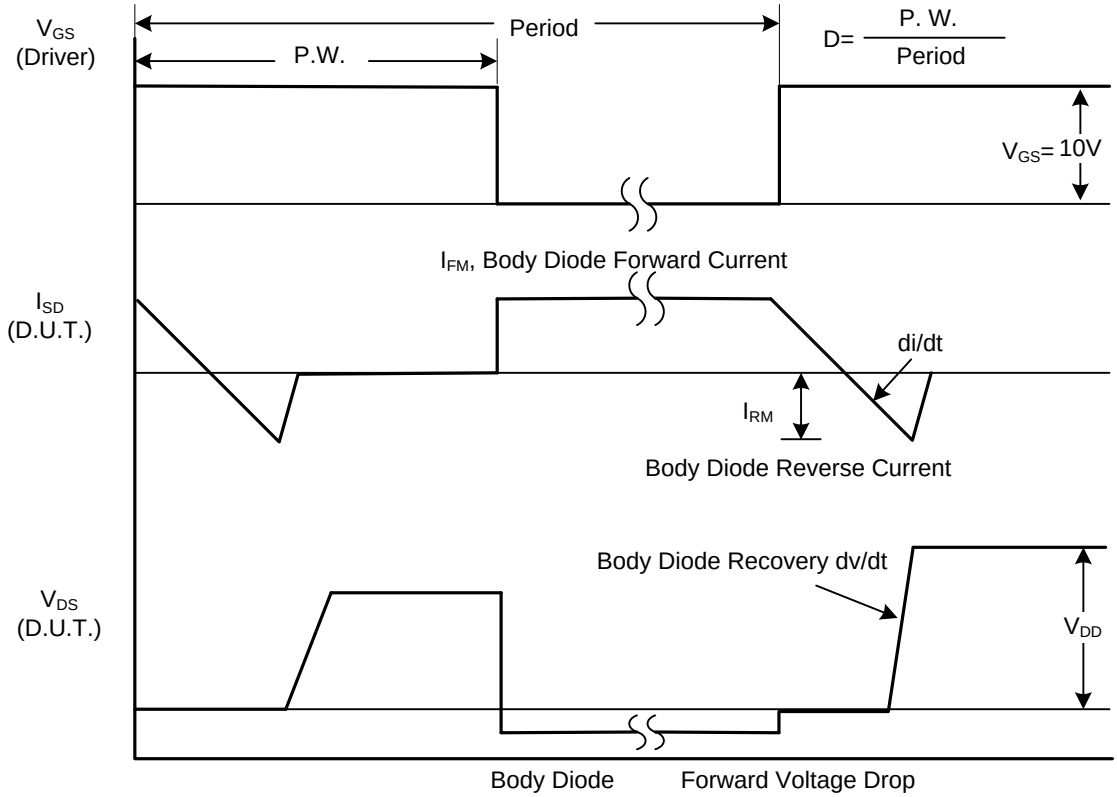
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V, T_J=-55°C	89			V
			I_D=250μA, V_{GS}=0V, T_J=25°C	100	130		V
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+10V, V_{DS}=0V, T_J=25°C		10	100	nA
	Reverse		V_{GS}=-10V, V_{DS}=0V, T_J=25°C		-10	-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA, T_J=25°C	1		3	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=5V, I_D=1.75A, T_J=25°C		200	250	mΩ
			V_{GS}=5V, I_D=1.75A, T_J=150°C			575	mΩ
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=50V, I_D=1.3A, T_J=25°C		20		nC
Gate to Source Charge		Q_{GS}			3.7		nC
Gate to Drain Charge		Q_{GD}			3.6		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=50V, V_{GS}=10V, R_L=0.5Ω, $R_{G(ext)}$=6Ω, T_J=25°C		30		ns
Rise Time		t_R			30		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			140		ns
Fall-Time		t_F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S	T_J=25°C			3.5	A
Maximum Body-Diode Pulsed Current		I_{SM}	T_J=25°C, t_p≤10μs			14	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=3.5A, V_{GS}=0V, T_J=25°C		0.87	1.5	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=3.5A, V_{GS}=0V, dI_S/dt=-100A/μs, V_{DS}=30V, T_J=25°C		50		ns
Body Diode Reverse Recovery Charge		Q_{rr}			100		nC

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

■ TEST CIRCUITS AND WAVEFORMS

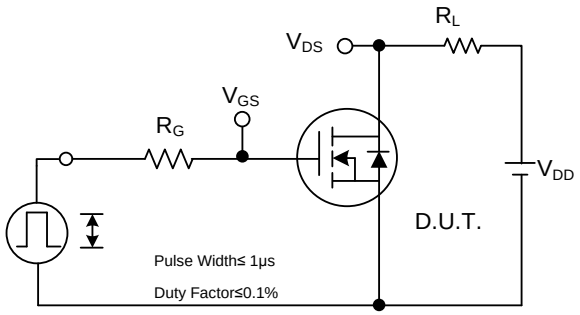


Peak Diode Recovery dv/dt Test Circuit

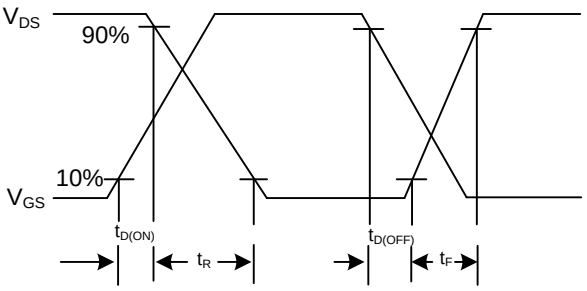


Peak Diode Recovery dv/dt Waveforms

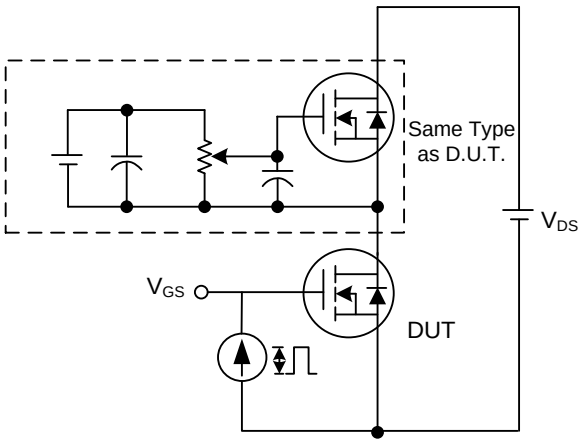
■ TEST CIRCUITS AND WAVEFORMS



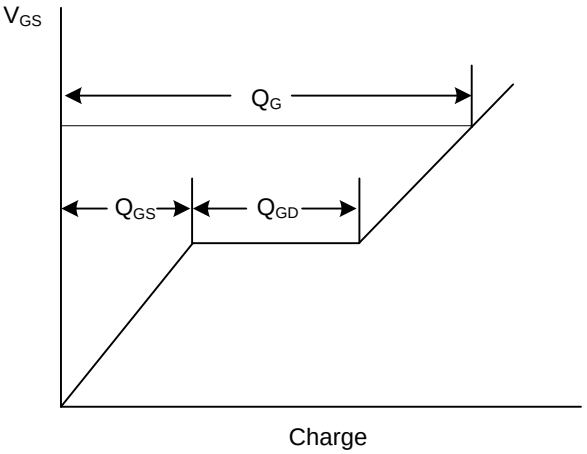
Switching Test Circuit



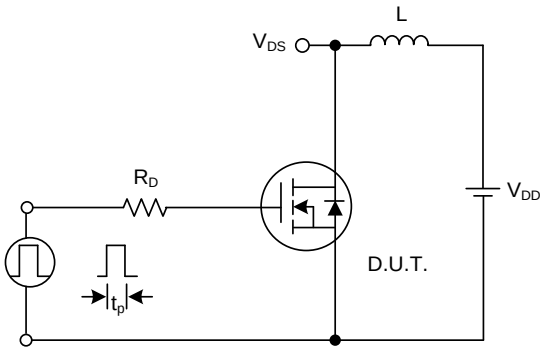
Switching Waveforms



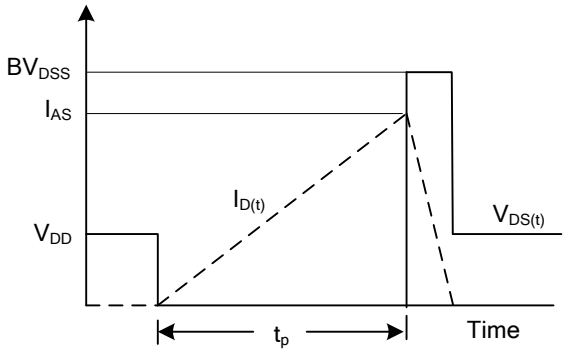
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms