



UTT4N10

Power MOSFET

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

DESCRIPTION

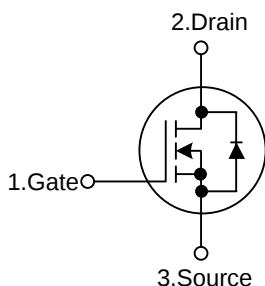
The UTC **UTT4N10** is an N-Channel Trench MOS Logic Level FET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance and low gate charge.

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

FEATURES

* $R_{DS(ON)} \leq 250 \text{ m}\Omega$ @ $V_{GS}=5\text{V}$, $I_D=1.75\text{A}$

SYMBOL

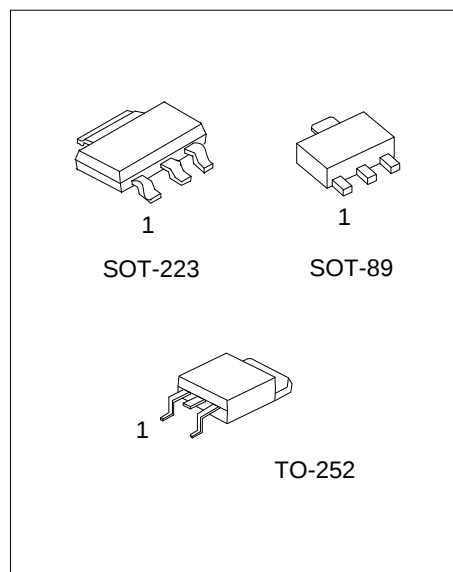


ORDERING INFORMATION

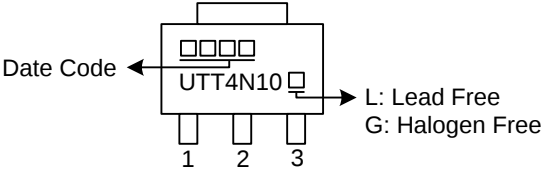
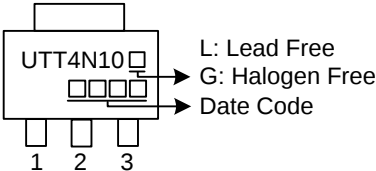
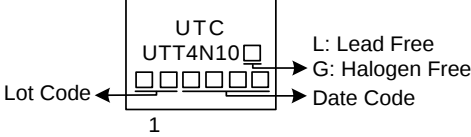
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT4N10L-AA3-R	UTT4N10G-AA3-R	SOT-223	G	D	S	Tape Reel
UTT4N10L-AB3-R	UTT4N10G-AB3-R	SOT-89	G	D	S	Tape Reel
UTT4N10L-TN3-R	UTT4N10G-TN3-R	TO-252	G	D	S	Tape Reel

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
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MARKING

PACKAGE	MARKING
SOT-89	 The diagram shows a SOT-89 package with three pins labeled 1, 2, and 3. The top surface has a date code consisting of four squares, with an arrow pointing to the first square labeled 'Date Code'. The part number 'UTT4N10' is printed below the date code, with an arrow pointing to the 'L' in 'Lead Free' and the 'G' in 'Halogen Free'.
SOT-223	 The diagram shows a SOT-223 package with three pins labeled 1, 2, and 3. The top surface has the part number 'UTT4N10' and a date code consisting of four squares, with an arrow pointing to the first square labeled 'Date Code'. The 'L' in 'Lead Free' and the 'G' in 'Halogen Free' are also indicated.
TO-252	 The diagram shows a TO-252 package with one pin labeled 1. The top surface has the UTC logo, the part number 'UTT4N10', a lot code consisting of five squares, and a date code consisting of four squares. Arrows point to the first square of the lot code labeled 'Lot Code', the 'L' in 'Lead Free' and the 'G' in 'Halogen Free', and the first square of the date code labeled 'Date Code'.

■ 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.

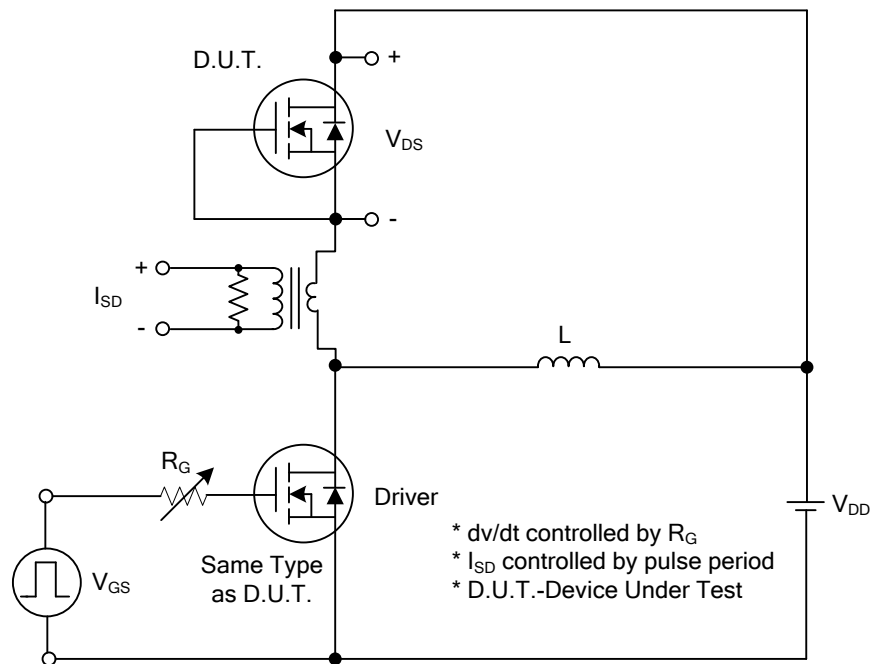
ELECTRICAL CHARACTERISTICS

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,		50		ns
Body Diode Reverse Recovery Charge		Q _{rr}	V _{DS} =30V, T _J =25°C		100		nC

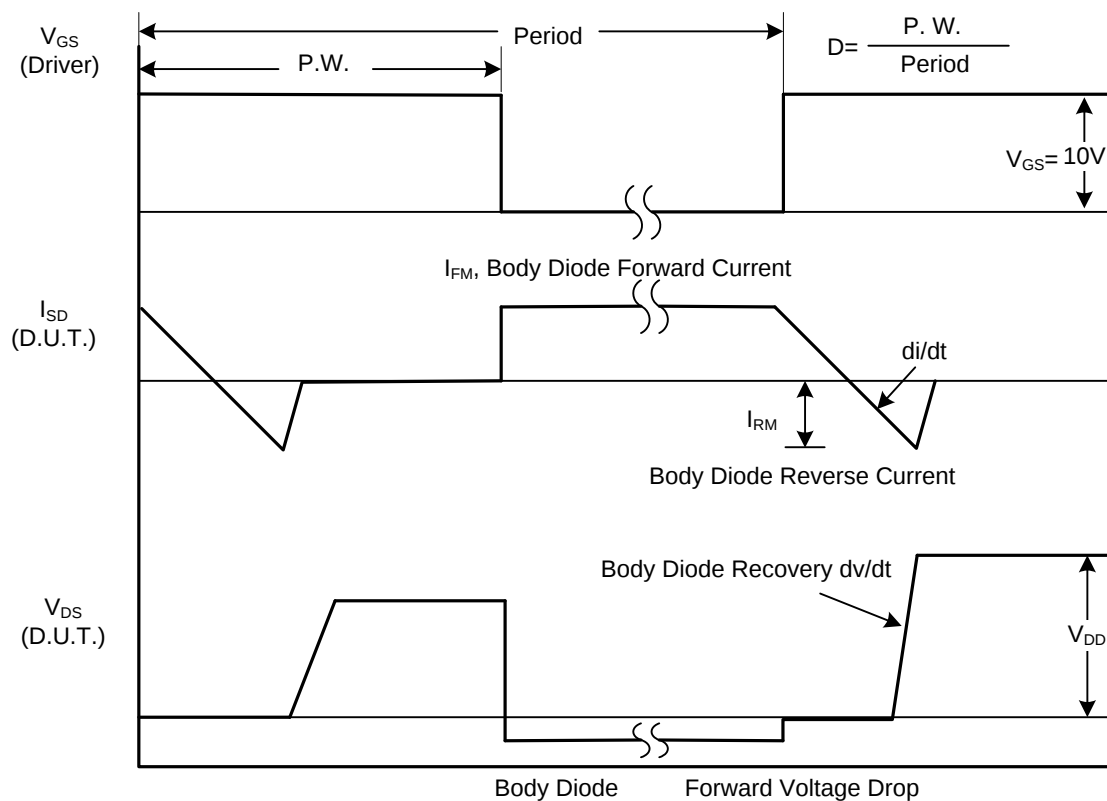
Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

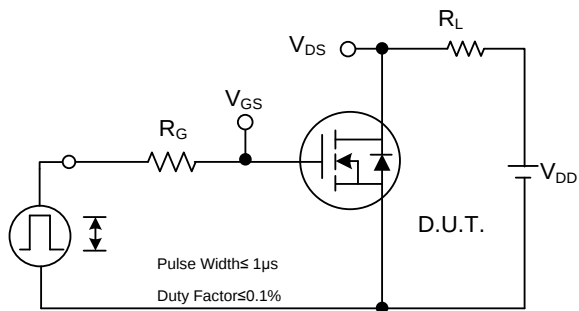


Peak Diode Recovery dv/dt Test Circuit

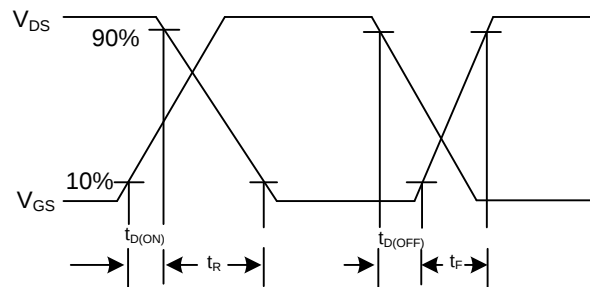


Peak Diode Recovery dv/dt Waveforms

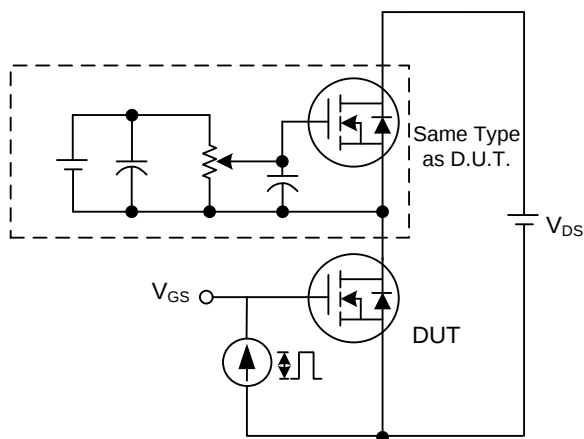
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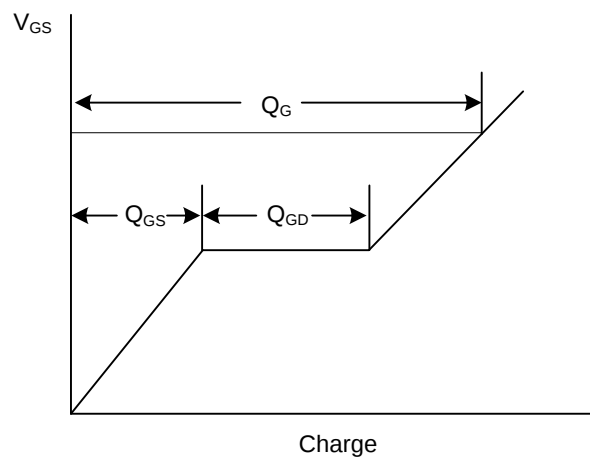
Switching Test Circuit



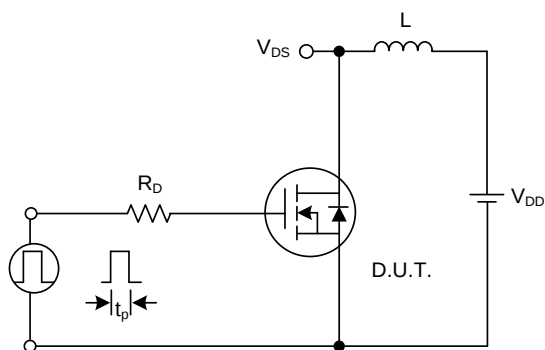
Switching Waveforms



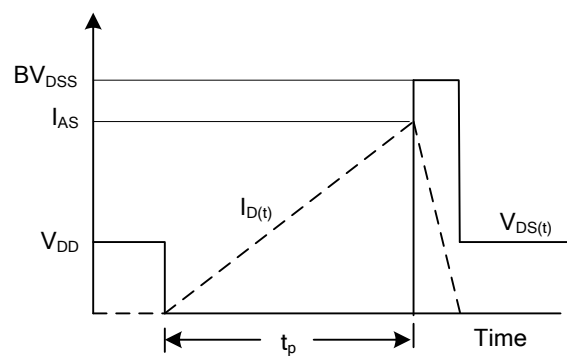
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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