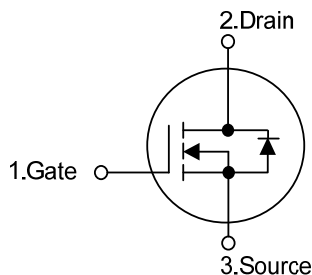


**UTZ24N****Power MOSFET****17A, 55V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UTZ24N** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance. The UTC **UTZ24N** is suitable for high efficiency synchronous rectification in SMPS, primary side switch and telecom bricks.

FEATURES

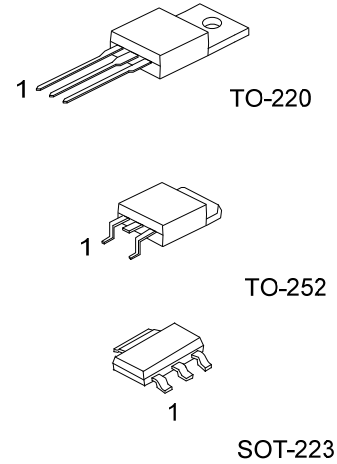
- * $R_{DS(ON)} \leq 38 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=10\text{A}$
 $R_{DS(ON)} \leq 55 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=10\text{A}$
- * High switching speed
- * Low gate charge

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTZ24NL-AA3-R	UTZ24NG-AA3-R	SOT-223	G	D	S	Tape Reel
UTZ24NL-TA3-T	UTZ24NG-TA3-T	TO-220	G	D	S	Tube
UTZ24NL-TN3-R	UTZ24NG-TN3-R	TO-252	G	D	S	Tape Reel

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

UTZ24NG-AA3-R		(1) Packing Type	(1) R: Tape Reel, T: Tube
		(2) Package Type	(2) AA3: SOT-223, TA3: TO-220, TN3: TO-252
		(3) Green Package	(3) G: Halogen Free and Lead Free L: Lead Free



MARKING

SOT-223	TO-220 / TO-252
UTZ24N 1 L: Lead Free G: Halogen Free Date Code	UTC UTZ24N Lot Code 1 L: Lead Free G: Halogen Free Date Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	55	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	17	A
	Pulsed	I_{DM}	68	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	16	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.3	V/ns
Power Dissipation	SOT-223	P_D	4	W
	TO-220		92	W
	TO-252		44	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

- 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.
3. $L=0.1\text{mH}$, $I_{AS}=18\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$
4. $I_{SD} \leq 17\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	150	$^{\circ}\text{C}/\text{W}$
	TO-220		62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		50	$^{\circ}\text{C}/\text{W}$
Junction to Case	SOT-223	θ_{JC}	31.25 (Note)	$^{\circ}\text{C}/\text{W}$
	TO-220		1.35	$^{\circ}\text{C}/\text{W}$
	TO-252		2.85 (Note)	$^{\circ}\text{C}/\text{W}$

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

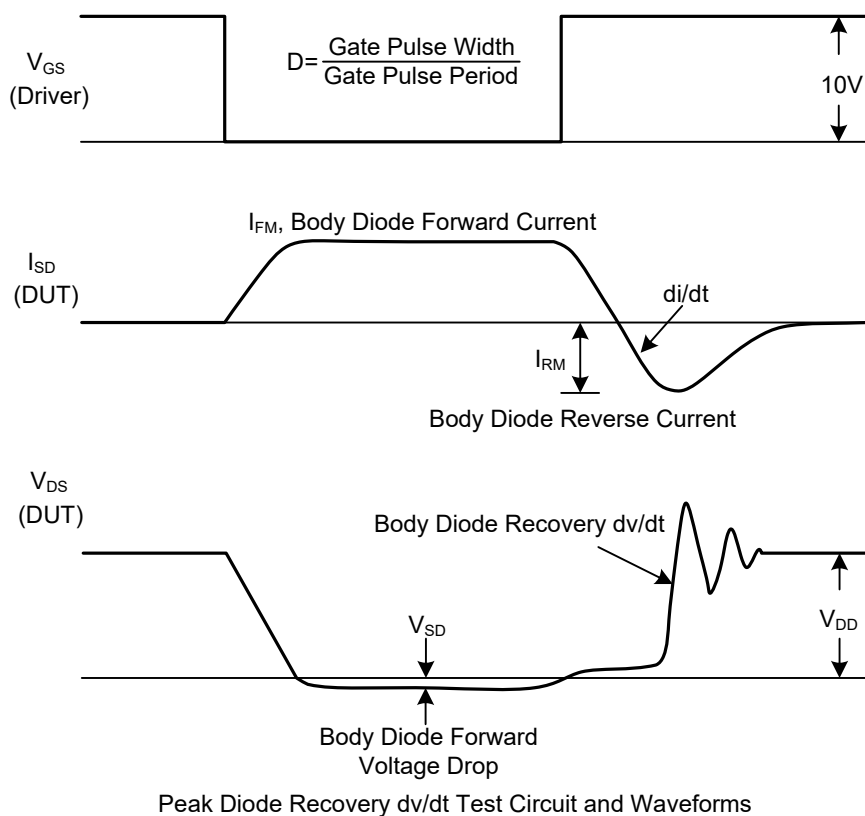
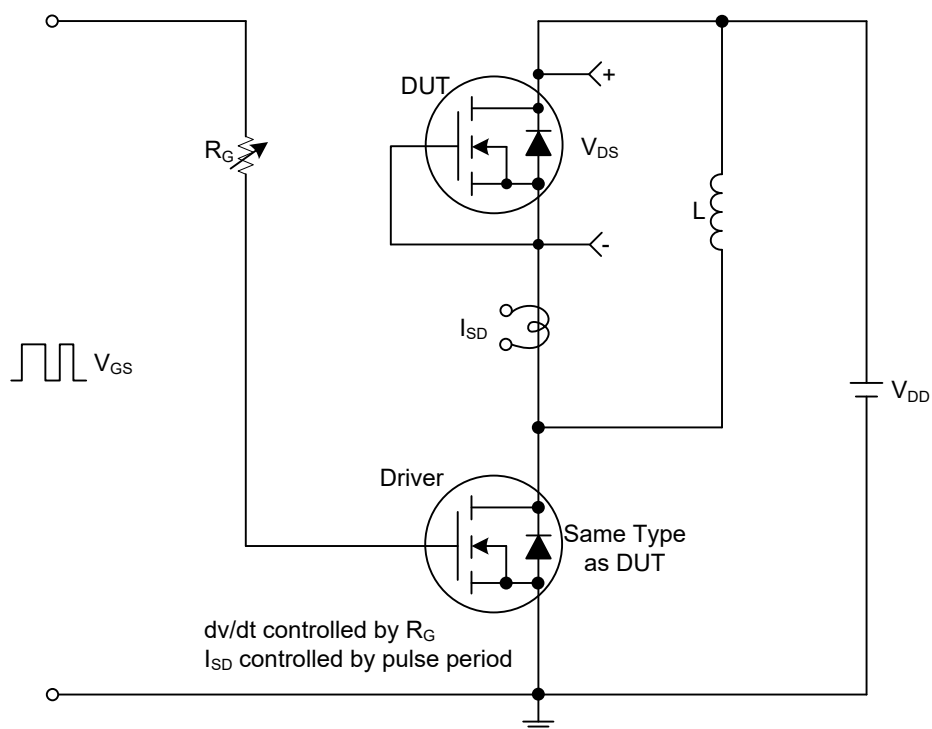
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	55			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =55V, 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	1.5		3.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =10A			38	mΩ
			V _{GS} =4.5V, I _D =10A			55	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		1020		pF
Output Capacitance		C _{OSS}			213		pF
Reverse Transfer Capacitance		C _{RSS}			152		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =30V, V _{GS} =10V, I _D =17A , I _G =1mA(Note 1, 2)		25		nC
Gate to Source Charge		Q _{GS}			4.5		nC
Gate to Drain Charge		Q _{GD}			5		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =17A, R _G =3Ω (Note 1, 2)		5		ns
Rise Time		t _R			16		ns
Turn-OFF Delay Time		t _{D(OFF)}			17.5		ns
Fall-Time		t _F			18.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				17	A
Maximum Body-Diode Pulsed Current		I _{SM}				68	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =10A, V _{GS} =0V			1.3	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =10A, V _{GS} =0V,		35		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dt =100A/μs		14		nC

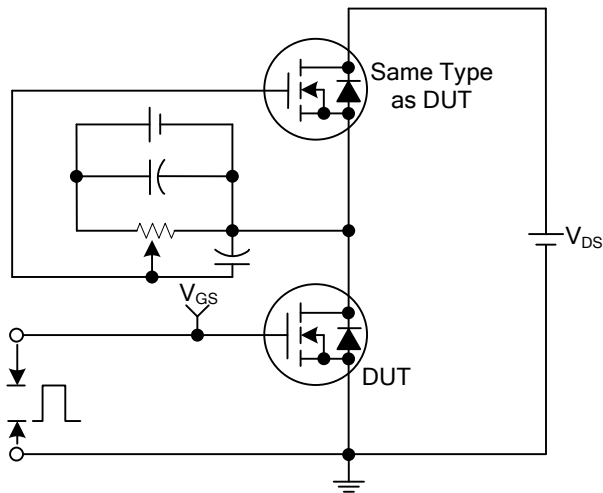
Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

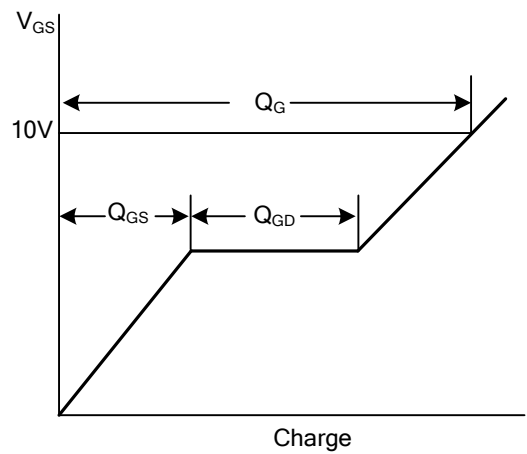
■ TEST CIRCUITS AND WAVEFORMS



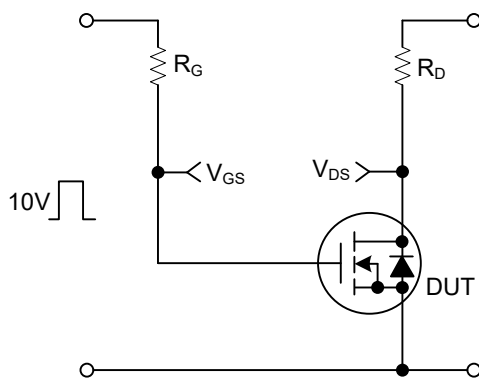
■ TEST CIRCUITS AND WAVEFORMS



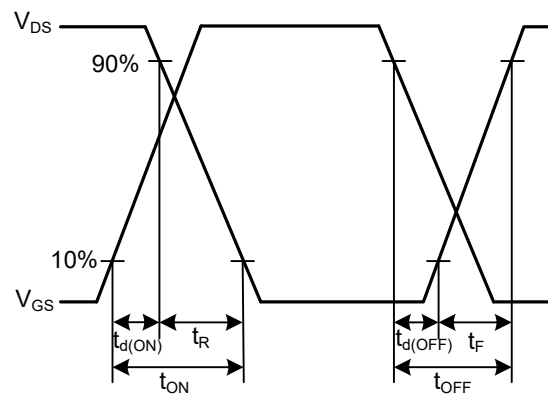
Gate Charge Test Circuit



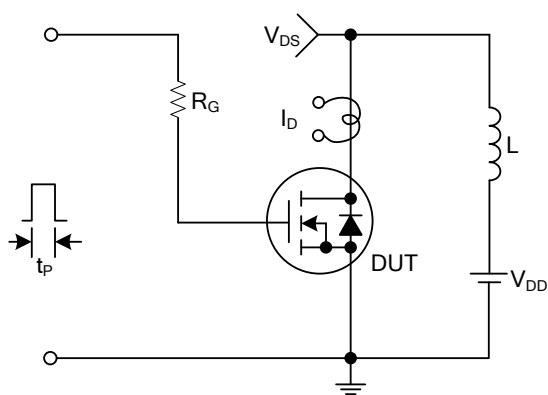
Gate Charge Waveforms



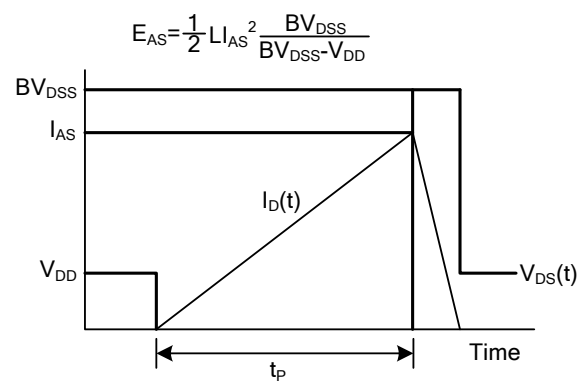
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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