



UTT18N20H

Preliminary

POWER MOSFET

18A, 200V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

DESCRIPTION

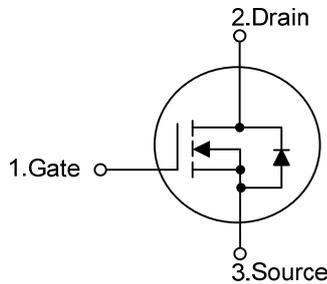
The UTC **UTT18N20H** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with ideal for low voltage inverter applications.

The UTC **UTT18N20H** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

FEATURES

- * $R_{DS(ON)} < 125m\Omega @ V_{GS}=10V, I_D=10A$
- * High Cell Density Trench Technology
- * High Power and Current Handling Capability

SYMBOL

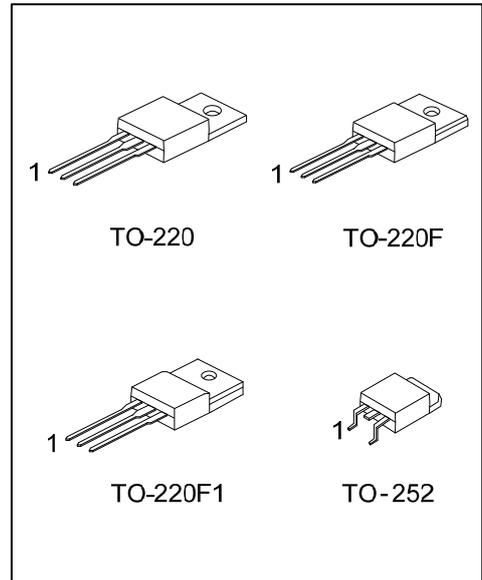


ORDERING INFORMATION

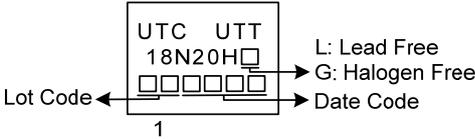
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT18N20HL-TA3-T	UTT18N20HG-TA3-T	TO-220	G	D	S	Tube
UTT18N20HL-TF1-T	UTT18N20HG-TF1-T	TO-220F1	G	D	S	Tube
UTT18N20HL-TF3-T	UTT18N20HG-TF3-T	TO-220F	G	D	S	Tube
UTT18N20HL-TN3-R	UTT18N20HG-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT18N20HG-TA3-R 	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Continuous	I_D	18	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	72	A
Avalanche Current (Note 3)		I_{AR}	15.6	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	12	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	14	V/nS
Power Dissipation	TO-220	P_D	110	W
	TO-220F/TO-220F1		40	W
	TO-252		50	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. $L=0.1\text{mH}$, $I_{AS}=15.6\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$.

4. $I_{SD} \leq 18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^\circ\text{C}$.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-220F1			
	TO-252			
Junction to Case	TO-220	θ_{JC}	4.46	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		3.1	$^\circ\text{C}/\text{W}$
	TO-252		1.13	$^\circ\text{C}/\text{W}$

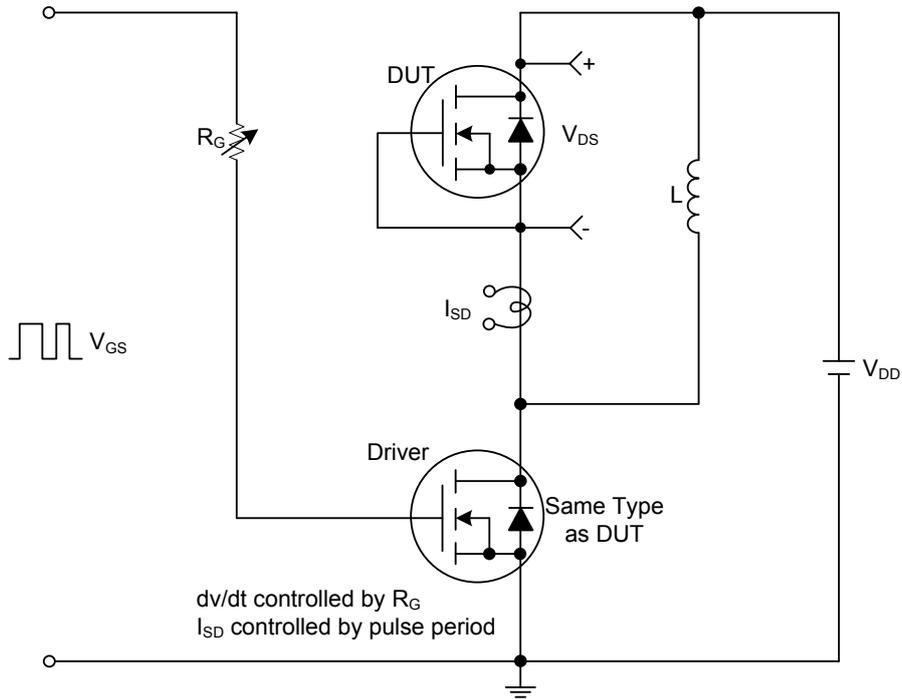
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =1mA, V _{GS} =0V	200			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A			125	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2100		pF
Output Capacitance	C _{OSS}			140		pF
Reverse Transfer Capacitance	C _{RSS}			45		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A, I _D =100μA (Note 1, 2)		47		nC
Gate to Source Charge	Q _{GS}			9		nC
Gate to Drain Charge	Q _{GD}			6.5		nC
Turn-on Delay Time (Note 1)	t _{D(ON)}	V _{DS} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (Note 1, 2)		78		ns
Rise Time	t _R			39		ns
Turn-off Delay Time	t _{D(OFF)}			238		ns
Fall-Time	t _F			81		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				18	A
Maximum Body-Diode Pulsed Current	I _{SM}				72	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =20A, V _{GS} =0V			1.2	V
Reverse recovery time (Note 1)	t _{rr}	I _S =18A, V _{GS} =0V,		110		ns
Reverse recovery charge	Q _{rr}	dI _F /dt = 100A/μs		340		nC

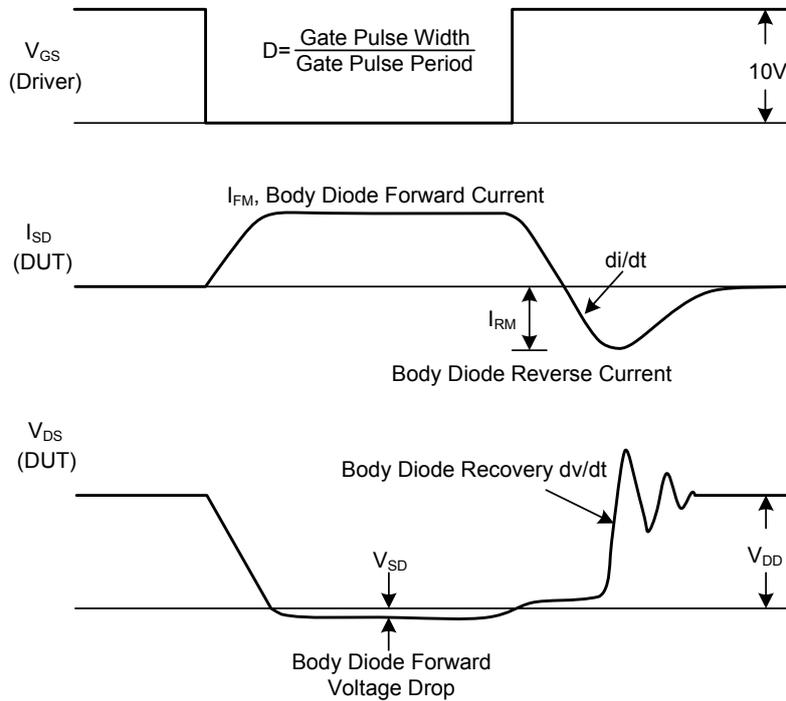
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



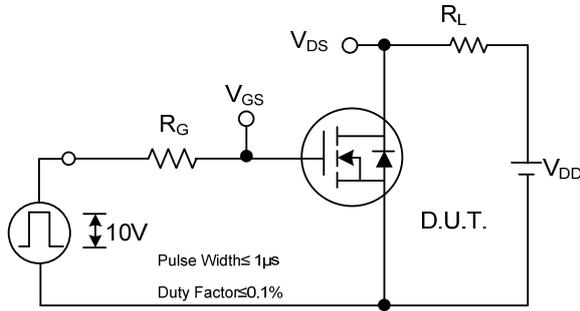
Peak Diode Recovery dv/dt Test Circuit



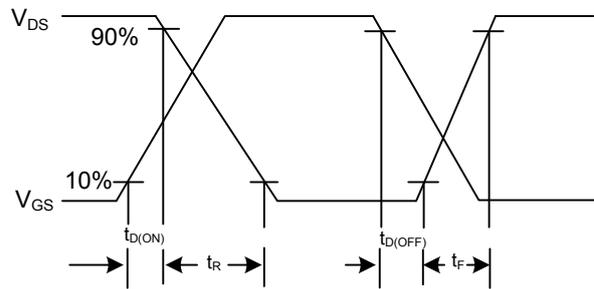
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

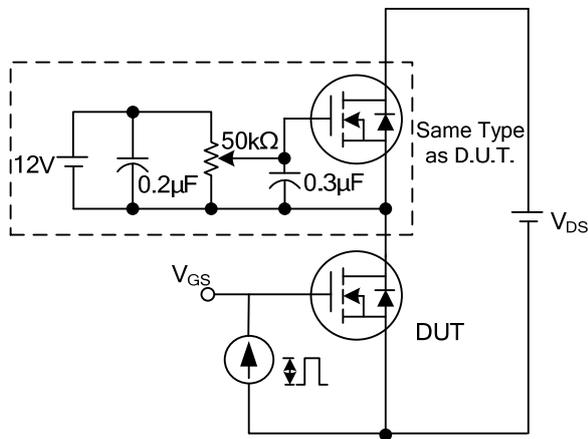
TEST CIRCUITS AND WAVEFORMS



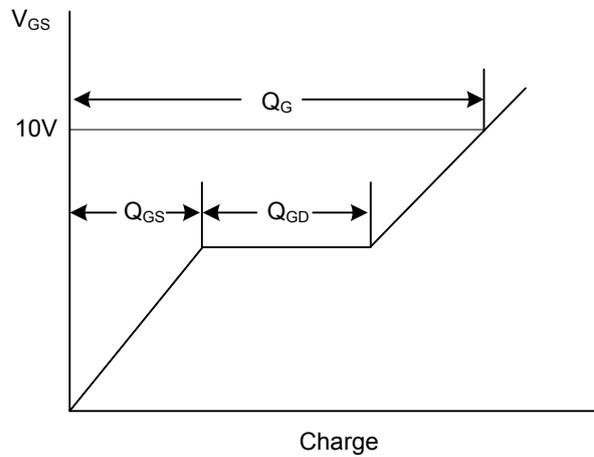
Switching Test Circuit



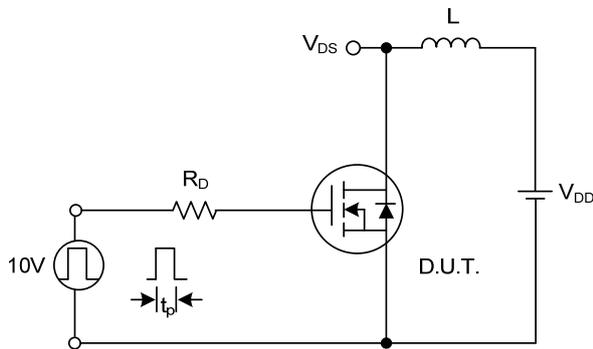
Switching Waveforms



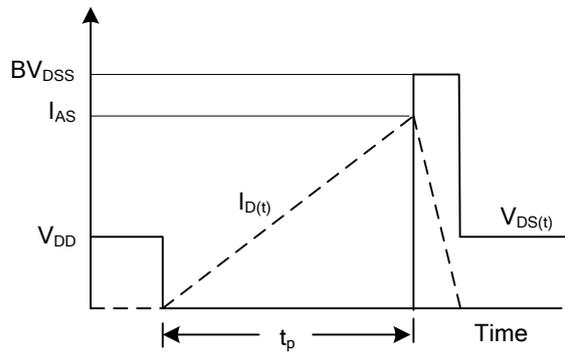
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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