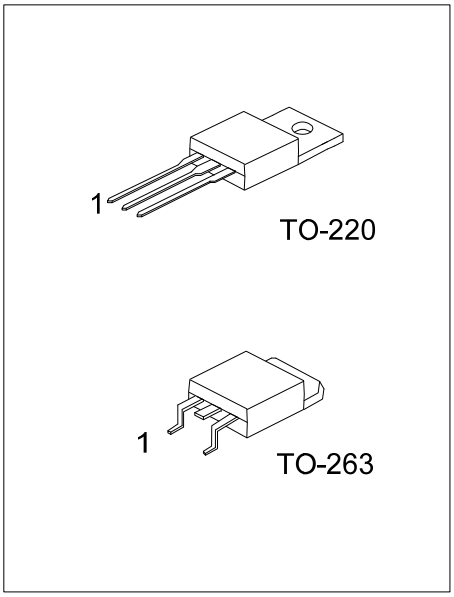
170A, 80V N-CHANNEL POWER MOSFET



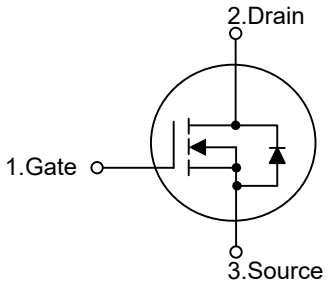
■ DESCRIPTION

The UTC **UT170N08H** is an N-channel enhancement mode Power FET, it uses UTC's advanced technology to provide customers a minimum on-state resistance and high switching speed.

■ FEATURES

* $R_{DS(ON)} \leq 4.0\ m\Omega$ @ V_{GS}=10V, I_D=85A
* High switching speed
* Improved dv/dt capability

■ SYMBOL



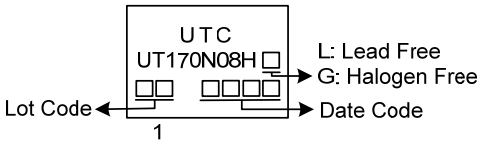
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT170N08HL-TA3-T	UT170N08HG-TA3-T	TO-220	G	D	S	Tube
UT170N08HL-TQ2-T	UT170N08HG-TQ2-T	TO-263	G	D	S	Tube
UT170N08HL-TQ2-R	UT170N08HG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT170N08HG-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	80	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	170	A
	Pulsed	I_{DM}	340	A
Avalanche Energy	Single Pulsed	E_{AS}	320	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	5.4	V/ns
Power Dissipation		P_D	250	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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.
3. L = 0.1mH, I_{AS} = 80A, V_{DD} = 30V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD}≤30A, di/dt≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	0.5	°C/W

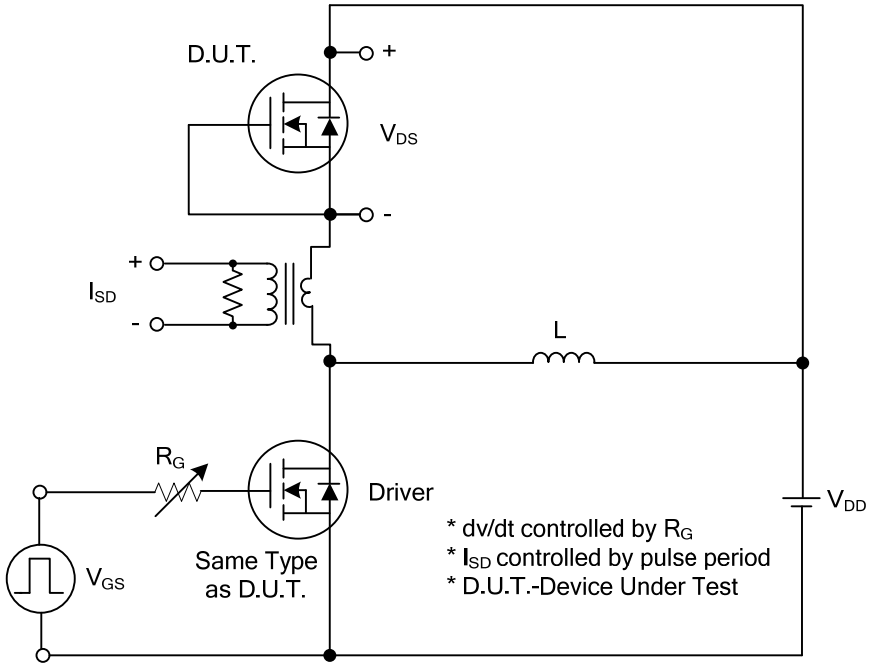
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

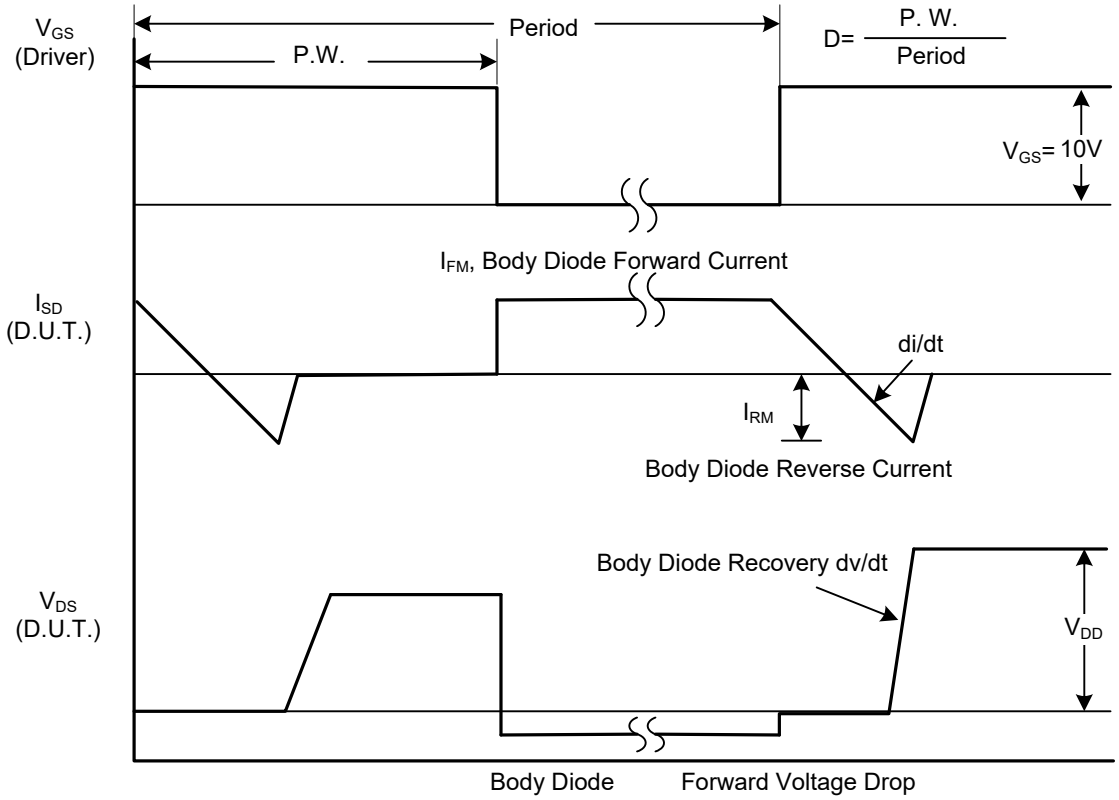
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	80			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=80V,V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	I_D=250μA, V_{DS}=V_{GS}	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=85A			4.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		12150		pF
Output Capacitance		C_{OSS}			1145		pF
Reverse Transfer Capacitance		C_{RSS}			950		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DD}=32V, V_{GS}=10V, I_D=170A, (Note 1, 2)		285		nC
Gate to Source Charge		Q_{GS}			51		nC
Gate to Drain Charge		Q_{GD}			105		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=20V, V_{GS}=10V I_D=170A, R_G=3Ω (Note 1, 2)		38		ns
Rise Time		t_R			32		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			130		ns
Fall-Time		t_F			63		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				170	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				340	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=170A			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=30A, V_{GS}=0V dI$_F$/dt=100A/μs		75		nS
Body Diode Reverse Recovery Charge		Q_{rr}			170		nC

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

■ TEST CIRCUITS AND WAVEFORMS

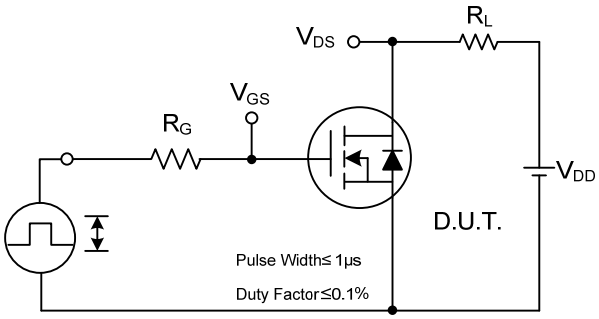


Peak Diode Recovery dv/dt Test Circuit

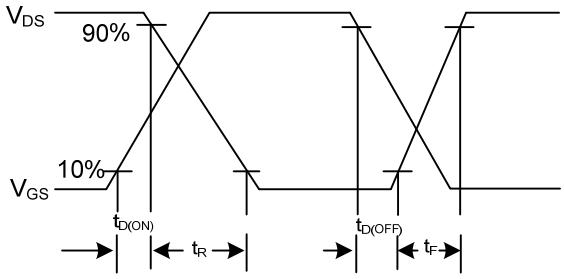


Peak Diode Recovery dv/dt Waveforms

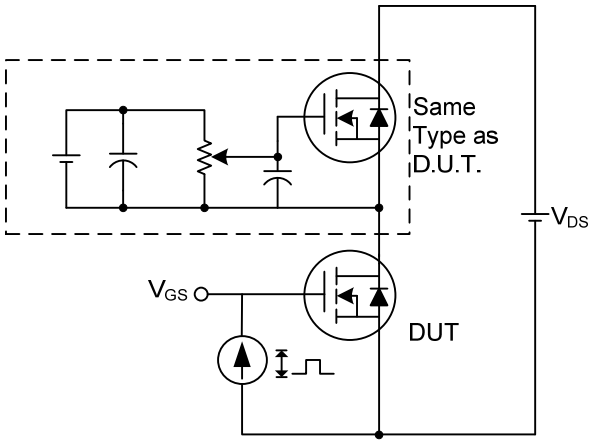
■ TEST CIRCUITS AND WAVEFORMS



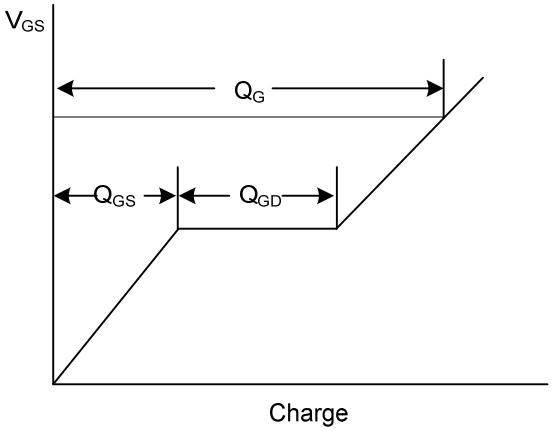
Switching Test Circuit



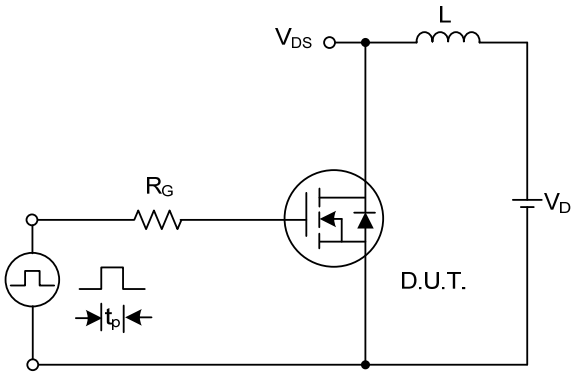
Switching Waveforms



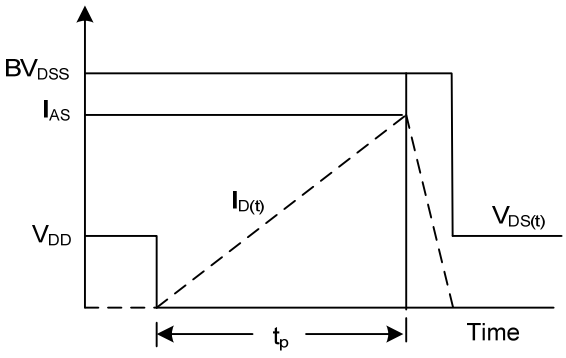
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms