



UTT150N06

Preliminary

Power MOSFET

150 Amps, 60 Volts N-CHANNEL POWER MOSFET

DESCRIPTION

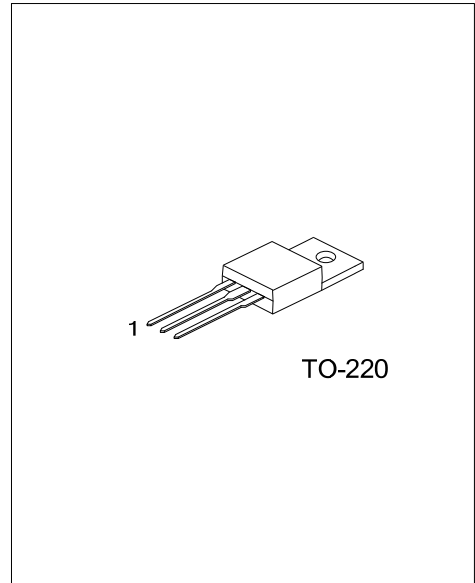
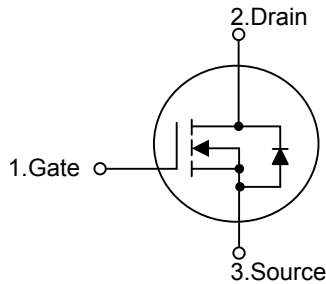
The UTC **UTT150N06** is an N-channel Power Trench MOSFET, using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance.

The UTC **UTT150N06** is generally applied in synchronous Rectification or DC to DC converter.

FEATURES

- * 150A, 60V, $R_{DS(ON)}=3.2m\Omega @ V_{GS}=10V, I_D = 75A$
- * Low Gate Charge (Typical 102nC)
- * High Switching Speed
- * High Power and Current Handling Capability
- * RoHS Compliant

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT150N06L-TA3-T	UTT150N06G-TA3-T	TO-220	G	D	S	Tube

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

UTT150N06L-TA3-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TA3: TO-220
	(3)Lead Free	(3) G: Halogen Free, L: Lead Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Peak Diode Recovery dv/dt (Note 3)		dv/dt	7.0	V/ns
Drain Current	Continuous ($T_C=25^\circ\text{C}$, Silicon Limited)	I_D	150	A
	Pulsed (Note 1)	I_{DM}	600	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	872	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	231	W
	Derate above 25°C		1.54	
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^\circ\text{C}$

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 CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C/W}$
Junction to Case	θ_{JC}	0.94	$^\circ\text{C/W}$

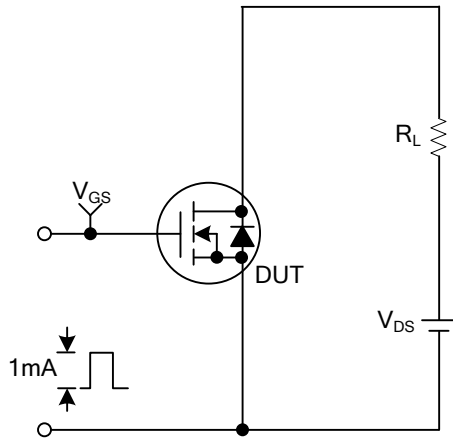
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$, $T_C=25^\circ\text{C}$	60			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=250\mu\text{A}$		0.04		$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$			1	μA
			$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$, $T_C=150^\circ\text{C}$			500	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.5	3.5	4.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=75\text{A}$		3.2	4.0	m Ω
Forward Transconductance		g_{FS}	$V_{DS}=10\text{V}$, $I_D=75\text{A}$ (Note 4)		169		S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		6190	8235	pF
Output Capacitance		C_{OSS}			900	1195	
Reverse Transfer Capacitance		C_{RSS}			385	580	
SWITCHING PARAMETERS							
Total Gate Charge		$Q_{G(tot)}$	$V_{GS}=10\text{V}$, $V_{DS}=48\text{V}$, $I_D=75\text{A}$ (Note 4, 5)		102	133	nC
Gate to Source Charge		Q_{GS}			32		
Gate to Drain Charge		Q_{GD}			32		
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=75\text{A}$, $R_{GEN}=4.7\Omega$, $V_{GS}=10\text{V}$		30	70	ns
Rise Time		t_R			40	90	
Turn-OFF Delay Time		$t_{D(OFF)}$			55	120	
Fall-Time		t_F			24	58	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				150	A
Maximum Body-Diode Pulsed Current		I_{SM}				600	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_{SD}=150\text{A}$, $V_{GS}=0\text{V}$			1.3	V
Body Diode Reverse Recovery Time		t_{RR}	$I_{SD}=150\text{A}$, $V_{GS}=0\text{V}$, $di_F/dt=100\text{A}/\mu\text{s}$ (Note 4)		41		ns
Body Diode Reverse Recovery Charge		Q_{RR}			47		

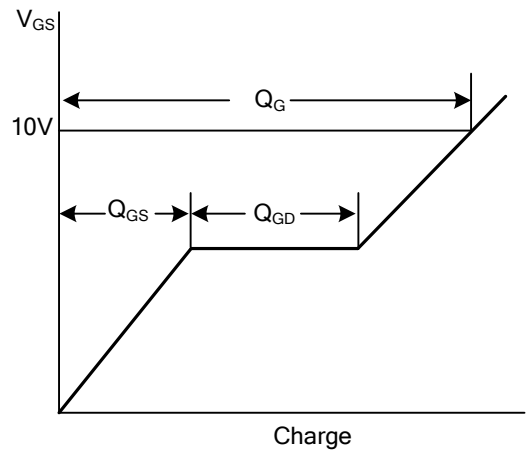
- Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature
 2. $L = 0.31\text{mH}$, $I_{AS} = 75\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
 3. $I_{SD} \leq 75\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
 4. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
 5. Essentially independent of operating temperature Typical Characteristics

■ TEST CIRCUITS AND WAVEFORMS

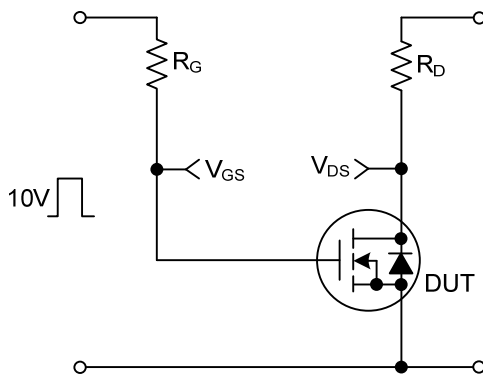
Gate Charge Test Circuit



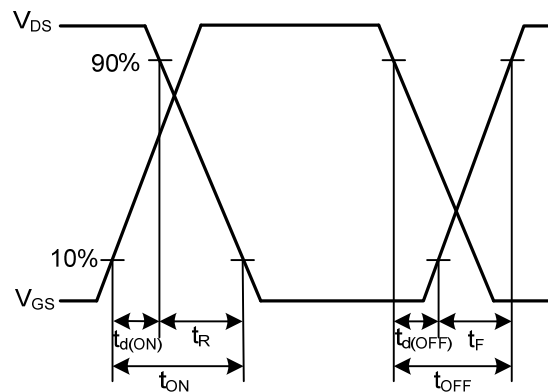
Gate Charge Waveforms



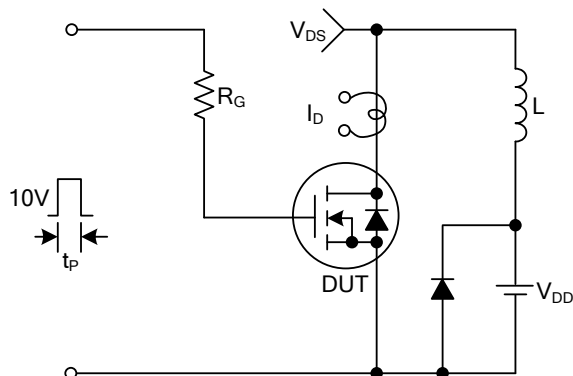
Resistive Switching Test Circuit



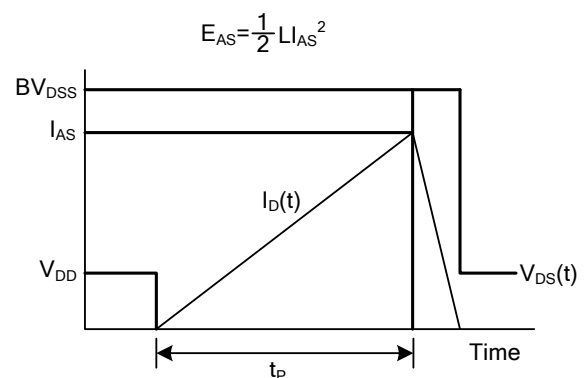
Resistive Switching Waveforms



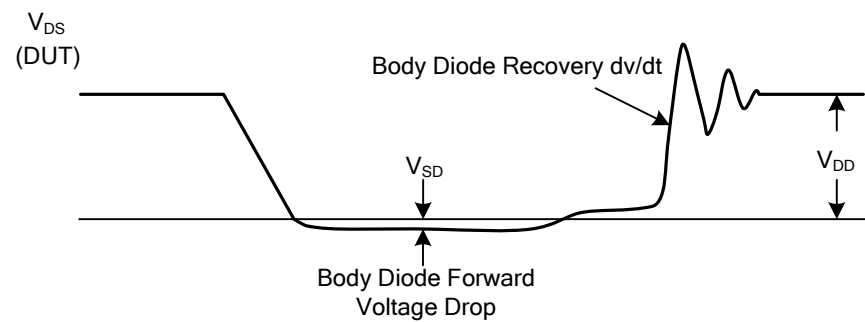
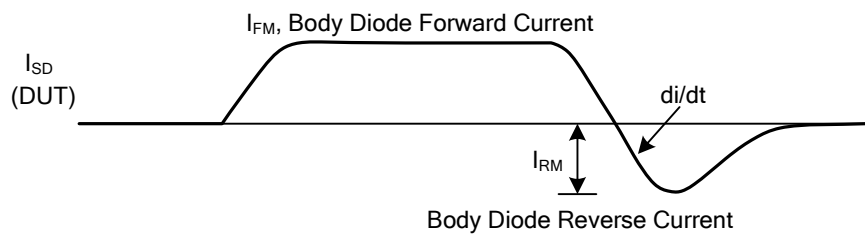
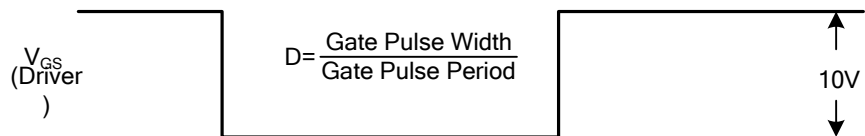
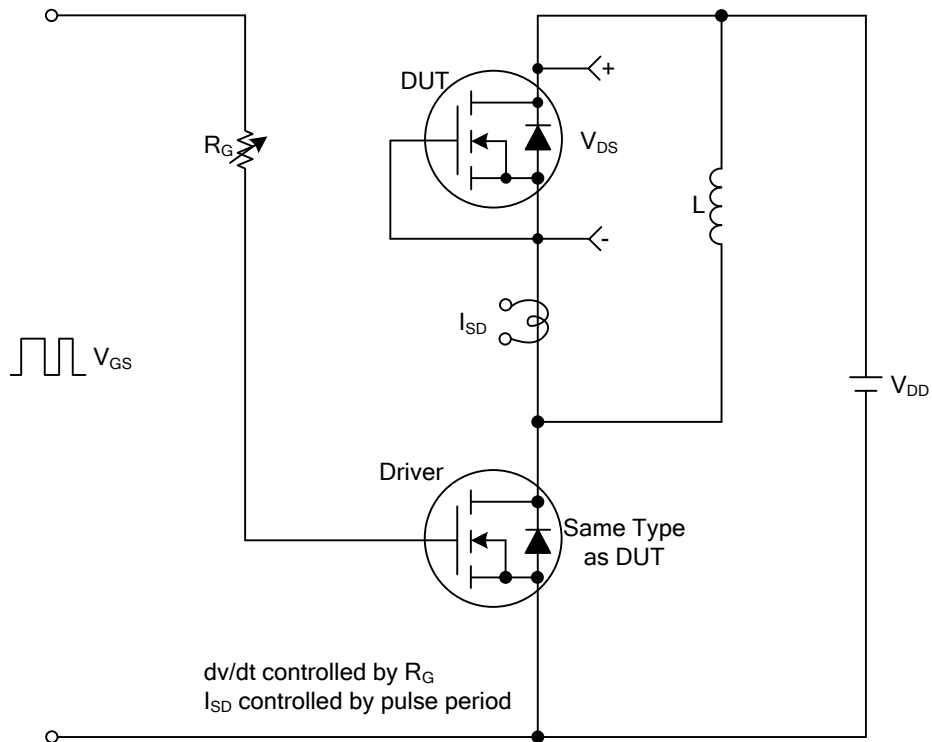
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



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