



UTT130N06M

POWER MOSFET

120A, 60V N-CHANNEL POWER MOSFET

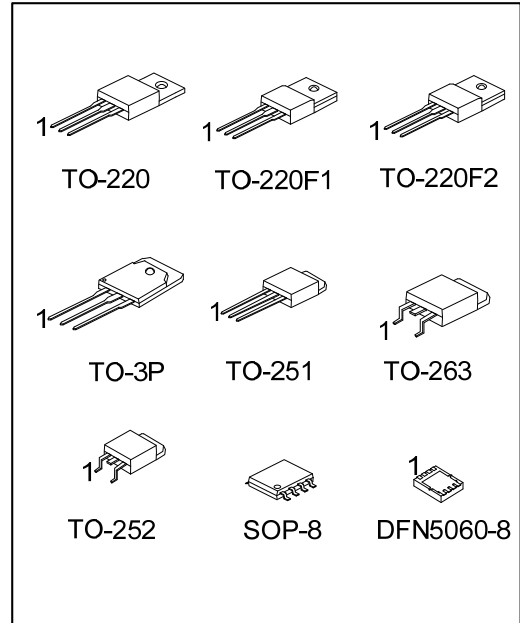
■ DESCRIPTION

The UTC **UTT130N06M** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and extremely low on-state resistance, etc.

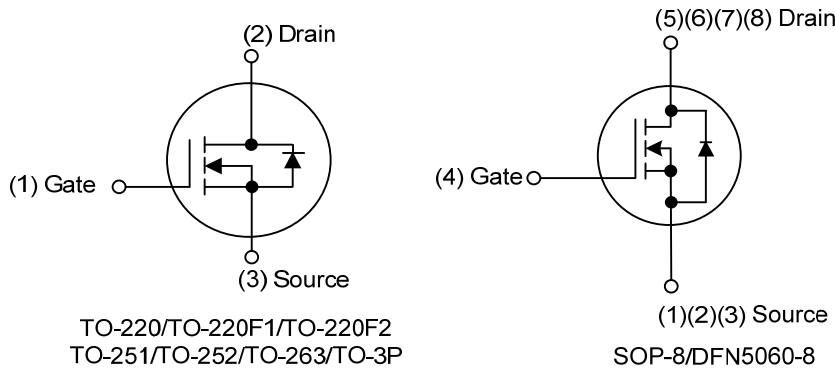
The UTC **UTT130N06M** is suitable for secondary side synchronous rectification, DC-DC converter, motor control and load switching, etc.

■ FEATURES

- * $R_{DS(ON)} \leq 5.9 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=25\text{A}$
- $R_{DS(ON)} \leq 7.2 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=25\text{A}$
- * High power and current handling capability
- * Low gate charge



■ SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT130N06ML-TA3-T	UTT130N06MG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-TF1-T	UTT130N06MG-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-TF2-T	UTT130N06MG-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-TM3-T	UTT130N06MG-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-TN3-R	UTT130N06MG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT130N06ML-TQ2-T	UTT130N06MG-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-TQ2-R	UTT130N06MG-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT130N06ML-T3P-T	UTT130N06MG-T3P-T	TO-3P	G	D	S	-	-	-	-	-	Tube
UTT130N06ML-S08-R	UTT130N06MG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT130N06MG-K08-5060-R	UTT130N06MG-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT130N06MG-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2 TM3: TO-251, TN3: TO-252, TQ2: TO-263 T3P: TO-3P, S08: SOP-8, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
TO-220 / TO-220F1 / TO-220F2 / TO-251 TO-252 / TO-263 TO-3P	UTC UTT 130N06M Lot Code → → → → → Date Code 1 L: Lead Free G: Halogen Free
SOP-8	UTC 130N06M 8 7 6 5 → Date Code 1 2 3 4 → Lot Code L: Lead Free G: Halogen Free
DFN5060-8	UTC UTT 130N06M Lot Code → → → → → Date Code

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

PARAMETER			SYMBOL	RATINGS	UNIT	
Drain-Source Voltage			V _{DSS}	60	V	
Gate-Source Voltage			V _{GSS}	±20	V	
Drain Current	Continuous (Note 2)	TO-220 TO-263	I _D	120	A	
		TO-220F1 TO-220F2 TO-3P		80		
		TO-251 TO-252		60	A	
		SOP-8 DFN5060-8		50	A	
		Pulsed (Note 3)		TO-220 TO-263	I _{DM}	240
	TO-220F1 TO-220F2 TO-3P		160	A		
	TO-251 TO-252		120	A		
	SOP-8 DFN5060-8		100	A		
	Avalanche Current			I _{AS}		40
	Avalanche Energy (Note 4)			E _{AS}	80	mJ
Power Dissipation	TO-220 TO-263	P _D	165	W		
	TO-220F1		36	W		
	TO-220F2		38	W		
	TO-251 TO-252		50	W		
	TO-3P		375	W		
	SOP-8		6	W		
	DFN5060-8		96	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. Current limited by bond wire.

3. Pulse width limited by max. junction temperature.

4. $L = 0.1\text{mH}$, $I_{AS} = 40\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-220F1			
	TO-220F2			
	TO-263			
	TO-251		75	°C/W
	TO-252			
	TO-3P			
Junction to Case	SOP-8	θ_{JC}	125	°C/W
	DFN5060-8		110	°C/W
	TO-220		0.75	°C/W
	TO-263			
	TO-220F1		3.4	°C/W
	TO-220F2		3.29	°C/W
	TO-251		2.5	°C/W
	TO-252			
	TO-3P		0.33	°C/W
	SOP-8		20.8	°C/W
	DFN5060-8		1.3	°C/W

Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

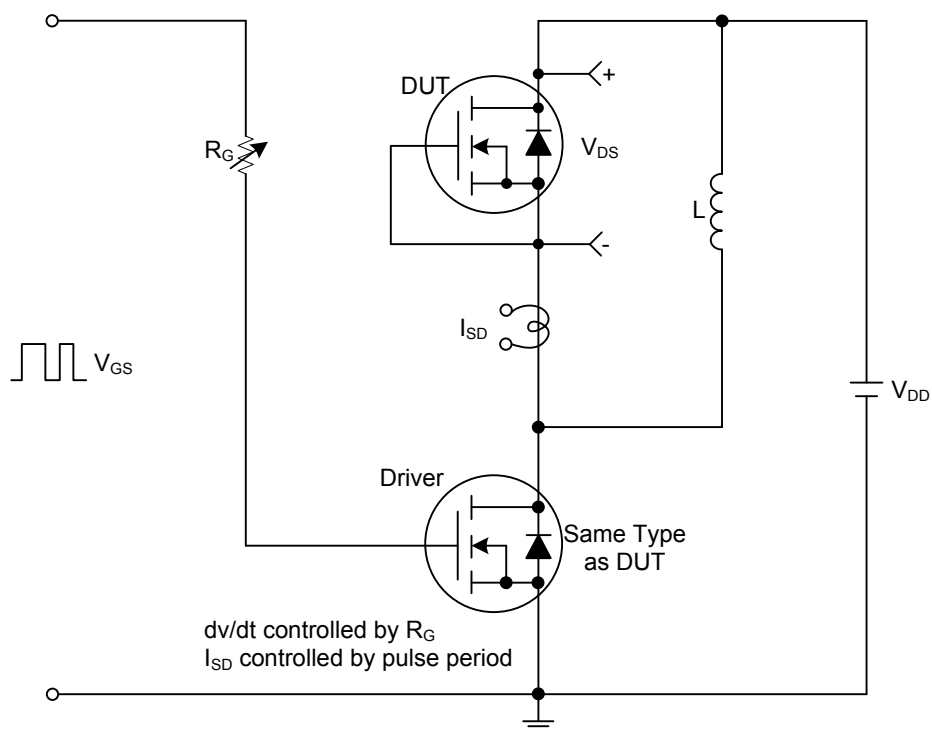
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	60			V	
Drain-Source Leakage Current		I _{DSS}	V _{DS} =60V, 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	1.0	1.8	3.0	V	
Static Drain-Source On-State Resistance (Note 1)		R _{DS(ON)}	V _{GS} =10V, I _D =20A	TO-220		5.9	mΩ	
				TO-220F1				
				TO-220F2				
				TO-263				
			TO-3P		TO-251		6.0	mΩ
			TO-252					
			SOP-8		6.5	mΩ		
			DFN5060-8					
			V _{GS} =4.5V, I _D =20A	TO-220		7.2	mΩ	
				TO-220F1				
				TO-220F2				
				TO-263				
TO-3P		TO-251		9.0	mΩ			
TO-252								
SOP-8								
DFN5060-8								
DYNAMIC PARAMETERS (Note 2)								
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		4050		pF	
Output Capacitance		C _{OSS}			465		pF	
Reverse Transfer Capacitance		C _{RSS}			325		pF	
SWITCHING PARAMETERS								
Total Gate Charge (Note 1)		Q _G	V _{DS} =30V, V _{GS} =10V, I _D =4.0A, I _G =1mA (Note 1,2)		95		nC	
Gate to Source Charge		Q _{GS}			8		nC	
Gate to Drain Charge		Q _{GD}			19		nC	
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =4A, R _G =3Ω, (Note 1,2)		11		ns	
Rise Time		t _R			18		ns	
Turn-OFF Delay Time		t _{D(OFF)}			72		ns	
Fall-Time		t _F			32		ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Continuous Drain-Source Diode Forward Current		I _S				40	A	
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				160	A	
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =20A, V _{GS} =0V		0.8	1.3	V	
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, dI _F /dt=100A/μs		33		ns	
Body Diode Reverse Recovery Charge		Q _{rr}			41		μC	

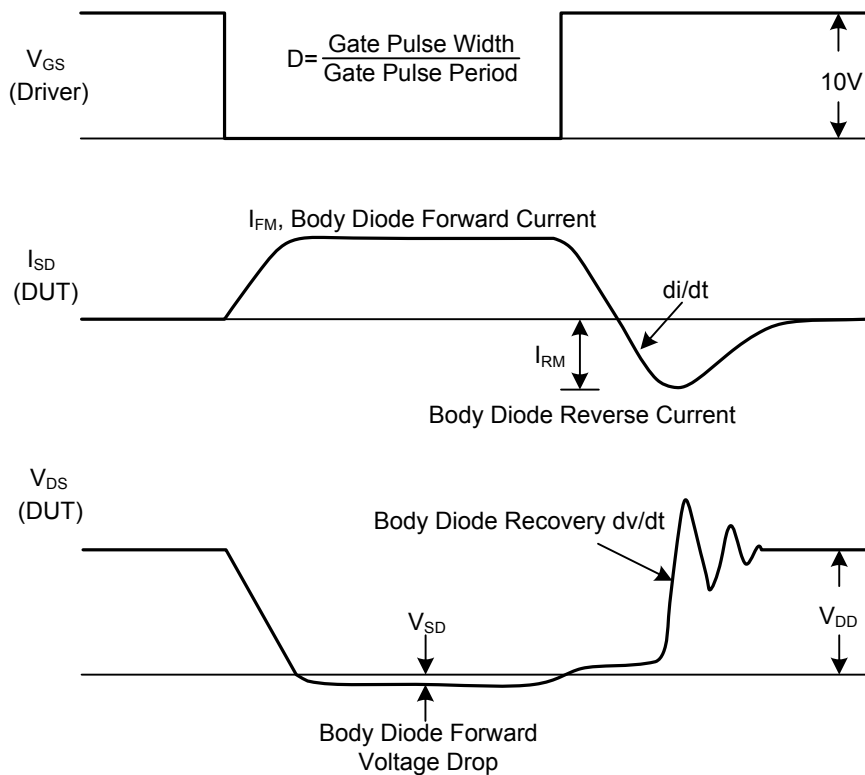
Notes: 1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.

2. Guaranteed by design, not subject to production testing.

■ TEST CIRCUITS AND WAVEFORMS



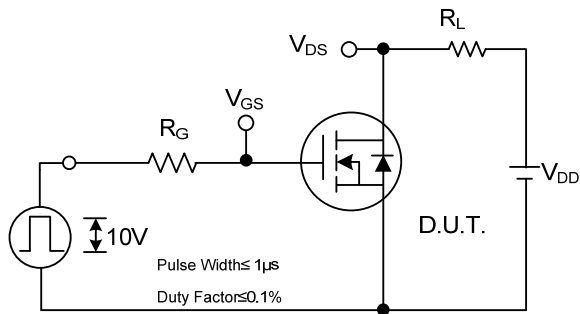
Peak Diode Recovery dv/dt Test Circuit



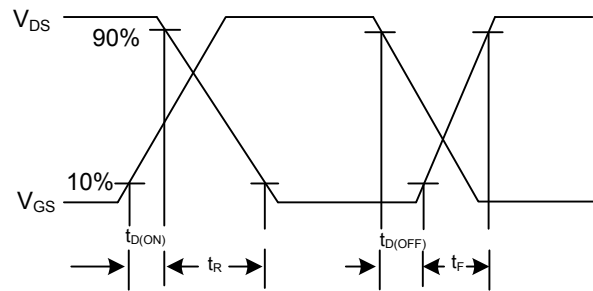
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

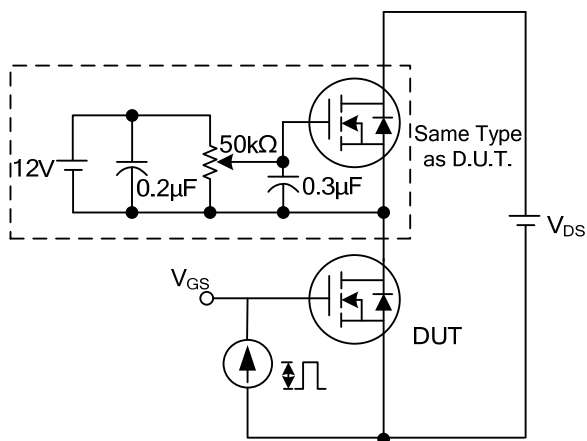
■ TEST CIRCUITS AND WAVEFORMS



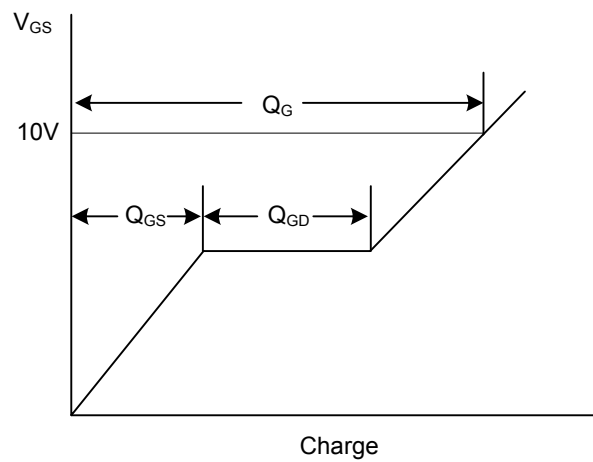
Switching Test Circuit



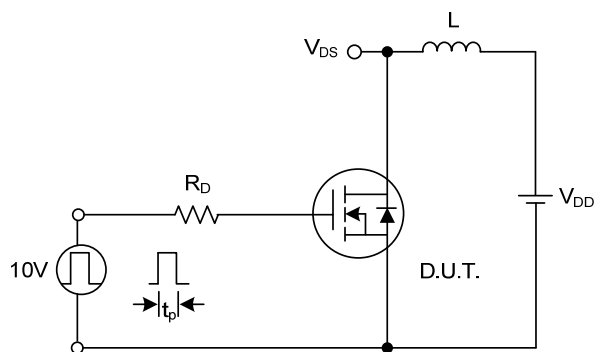
Switching Waveforms



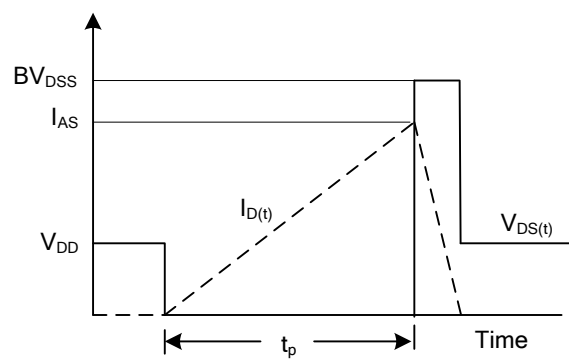
Gate Charge Test Circuit



Gate Charge Waveform

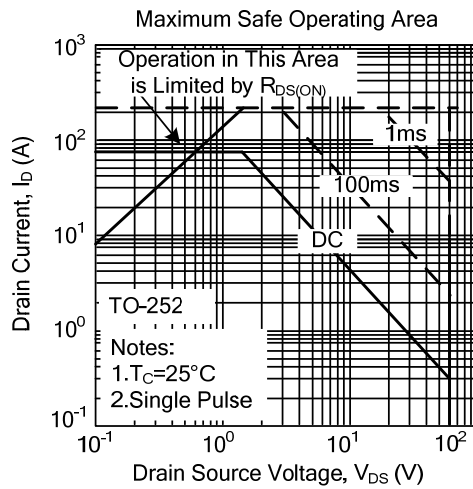


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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