



UTT50P10-H

Power MOSFET

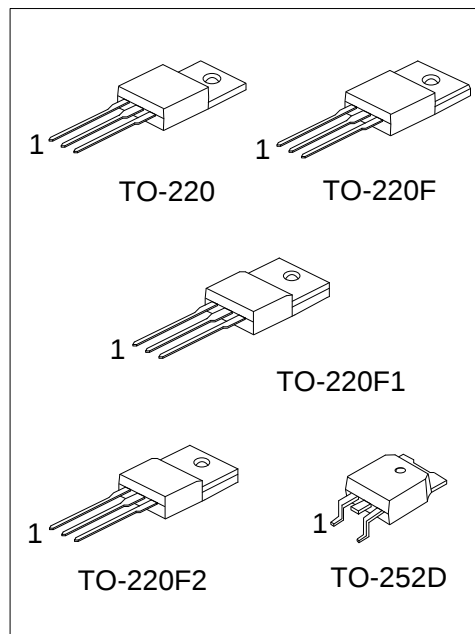
-50A, -100V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UTT50P10-H** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance. It can also withstand high energy in the avalanche.

FEATURES

- * $R_{DS(ON)} \leq 43 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$
- * $R_{DS(ON)} \leq 48 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -10\text{A}$
- * High Switching Speed
- * Fast switching
- * 100% EAS Guaranteed
- * Improved dv/dt capability



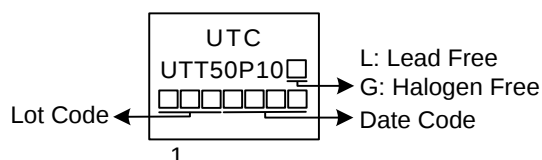
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT50P10L-TA3-T	UTT50P10G-TA3-T	TO-220	G	D	S	Tube
UTT50P10L-TF1-T	UTT50P10G-TF1-T	TO-220F1	G	D	S	Tube
UTT50P10L-TF2-T	UTT50P10G-TF2-T	TO-220F2	G	D	S	Tube
UTT50P10L-TF3-T	UTT50P10G-TF3-T	TO-220F	G	D	S	Tube
UTT50P10L-TND-R	UTT50P10G-TND-R	TO-252D	G	D	S	Tape Reel

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

UTT50P10G-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 TF3: TO-220F, TND: TO-252D (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	-100	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current	Continuous	I _D	-50	A
Pulsed Drain Current	Pulsed (Note 2)	I _{DM}	-120	A
Avalanche energy	Single Pulsed (Note 3)	E _{AS}	180	mJ
Power Dissipation	TO-220	P _D	110	W
	TO-220F/TO-220F1		34	W
	TO-220F2		50	W
	TO-252D			
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}=-60A, V_{DD}=-50V, R_G=25Ω, Starting T_J = 25°C.

4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ _{JA}	62.5	°C/W
	TO-220F1/TO-220F2			
	TO-252D		110	°C/W
Junction to Case	TO-220	θ _{JC}	1.13	°C/W
	TO-220F/TO-220F1		3.68	°C/W
	TO-220F2			
	TO-252D		2.5	°C/W

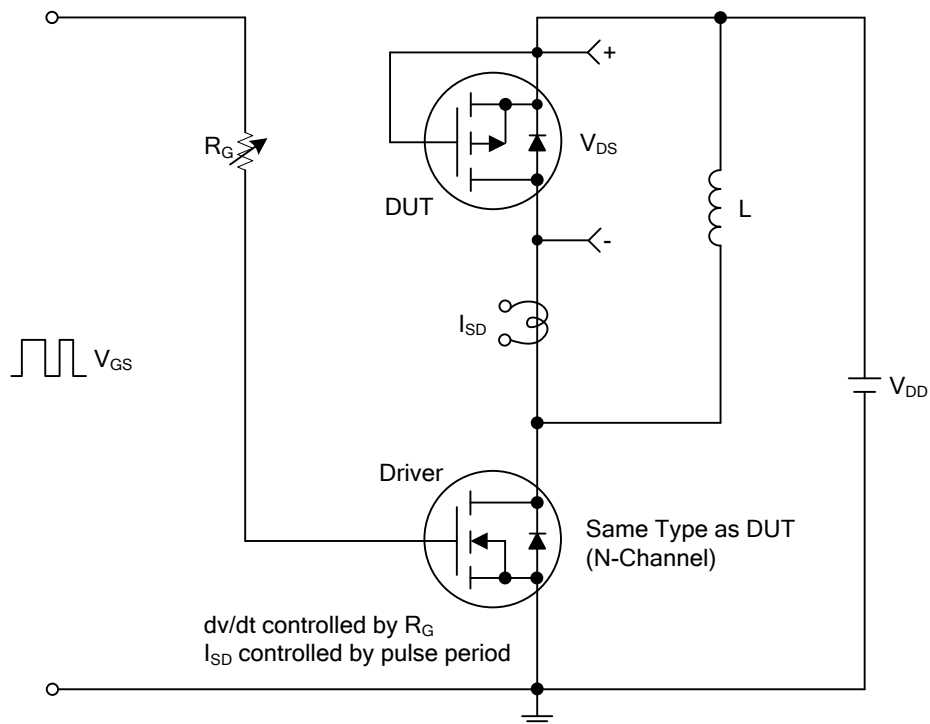
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	-100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V ,V _{GS} =+20V			+100	nA
	Reverse		V _{DS} =0V ,V _{GS} =-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250μA	-1.2		-2.5	V
Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-15A		36	43	mΩ
			V _{GS} =-4.5V, I _D =-10A		40	48	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		6315	9000	pF
Output Capacitance		C _{OSS}			220	330	pF
Reverse Transfer Capacitance		C _{RSS}			50	100	pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =-50V, V _{GS} =-10V, I _D =-10A		98	150	nC
Gate to Source Charge		Q _{GS}			16.2	30	nC
Gate to Drain Charge		Q _{GD}			13.8	26	nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =-50V, V _{GS} =-10V, I _D =-5.0A, R _G =25Ω		58	105	ns
Rise Time		t _R			24	50	ns
Turn-off Delay Time		t _{D(OFF)}			215	450	ns
Fall-Time		t _F			94	180	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Pulsed Current		I _S				-50	A
Drain-Source Diode Forward Voltage (Note 1)		I _{SM}				-100	A
Maximum Body-Diode Continuous Current		V _{SD}	I _S =-1.0A, V _{GS} =0V			-1.0	V

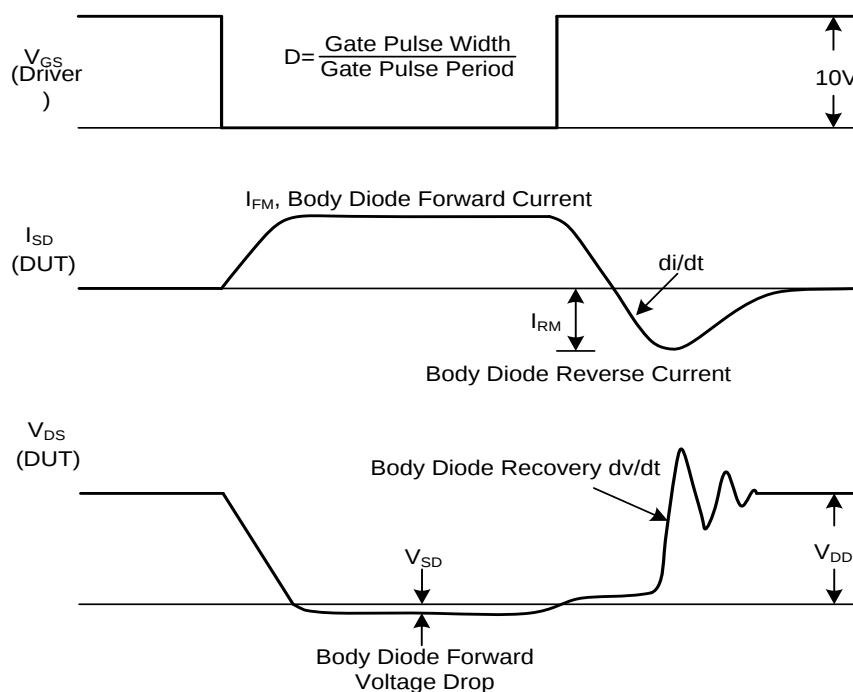
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

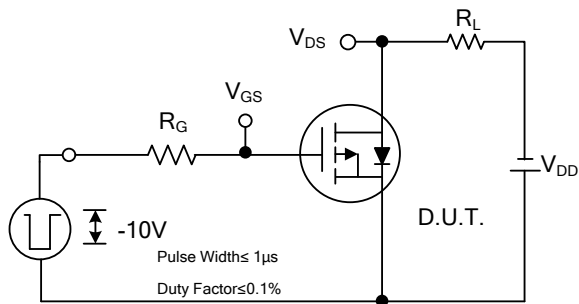


Peak Diode Recovery dv/dt Test Circuit

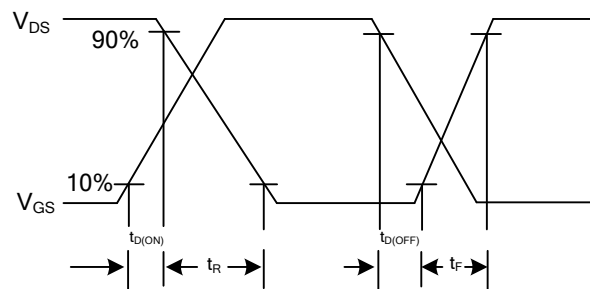


Peak Diode Recovery dv/dt Waveforms

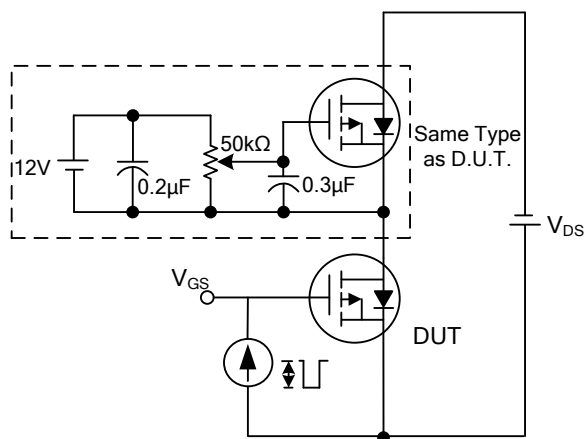
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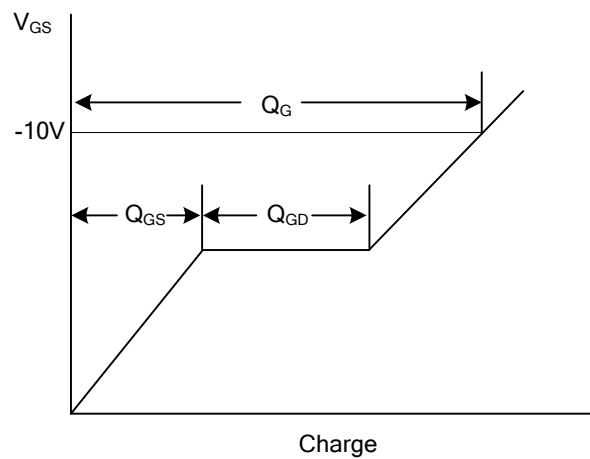
Switching Test Circuit



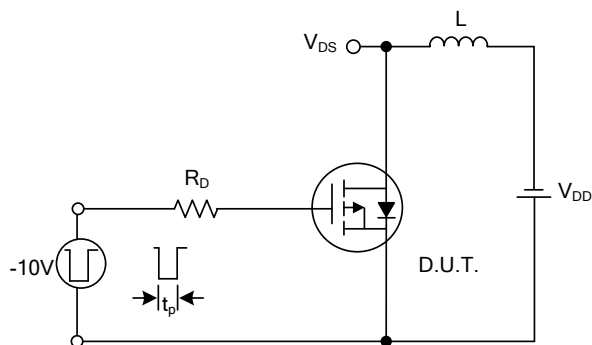
Switching Waveforms



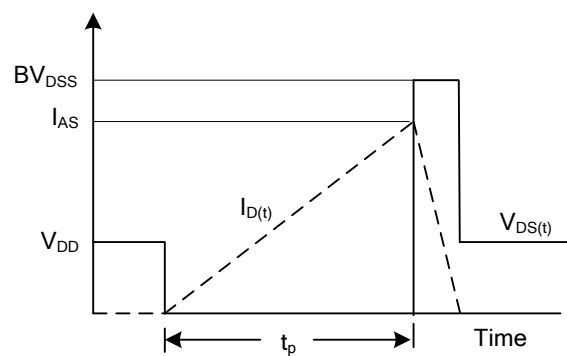
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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