

**UTT50P10**

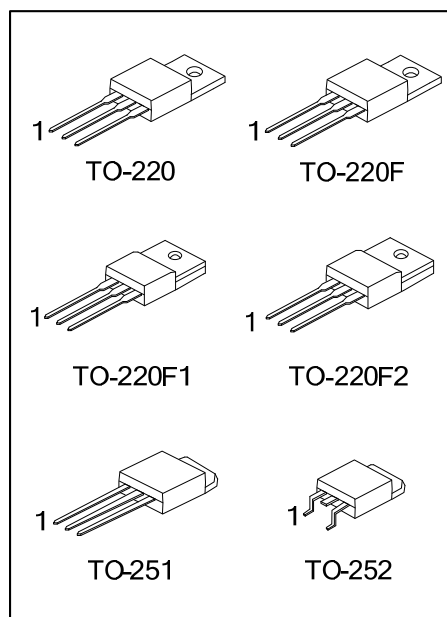
Preliminary

Power MOSFET**-50A, -100V P-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UTT50P10** 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

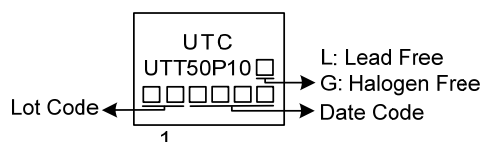
- * $V_{DS} = -100V$
- * $I_D = -50A$
- * $R_{DS(ON)} \leq 60\text{ m}\Omega$ @ $V_{GS} = -10V$, $I_D = -20A$
- * High Switching Speed

**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-TM3-T	UTT50P10G-TM3-T	TO-251	G	D	S	Tube
UTT50P10L-TN3-R	UTT50P10G-TN3-R	TO-252	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, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2, TM3: TO-251, 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
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	-50	A
	Pulsed	I_{DM}	-90	A
Power Dissipation	TO-220	P_D	140	W
	TO-220F/TO-220F1		28	W
	TO-220F2		40	W
	TO-251/TO-252		40	W
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 DATA**

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	TO-220F1/TO-220F2		50	$^{\circ}\text{C/W}$
	TO-251/TO-252		50	$^{\circ}\text{C/W}$
Junction to Case	TO-220	θ_{JC}	0.89	$^{\circ}\text{C/W}$
	TO-220F/TO-220F1		4.46	$^{\circ}\text{C/W}$
	TO-220F2		4.46	$^{\circ}\text{C/W}$
	TO-251/TO-252		3.12	$^{\circ}\text{C/W}$

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

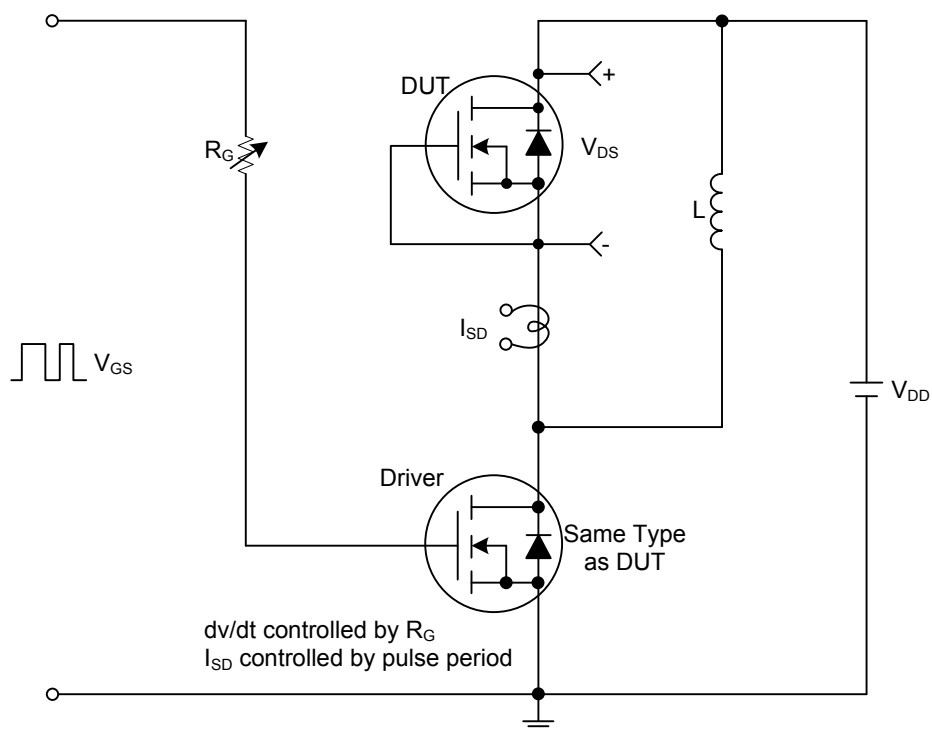
■ **ELECTRICAL CHARACTERISTICS**

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =-250μA, V _{GS} =0V	-100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =0.8×Max.rating, V _{GS} =0V, T _J =25°C			-1	μA
			V _{DS} =0.8×Max.rating, V _{GS} =0V, T _J =125°C			-500	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V			+100	nA
	Reverse		V _{GS} =-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0		-3.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-20A			60	mΩ
			V _{GS} =-4.5V, I _D =-15A			65	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-50V, f=1.0MHz		4200		pF
Output Capacitance		C _{OSS}			250		pF
Reverse Transfer Capacitance		C _{RSS}			110		pF
SWITCHING PARAMETERS							
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-50V, V _{GS} =-10V, I _D =-50A, R _G =1Ω		80	130	ns
Rise Time		t _R			76	130	ns
Turn-OFF Delay Time		t _{D(OFF)}			740	900	ns
Fall-Time		t _F			200	400	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V _{SD}	I _F =-20A, V _{GS} =0V, Pulse test, t≤300μs, duty cycle d≤2%			-2.0	V
Body Diode Reverse Recovery Time		t _{RR}	T _J =25°C, I _F =-20A, V _R =-50V, di/dt=-100A/μs		80	120	ns

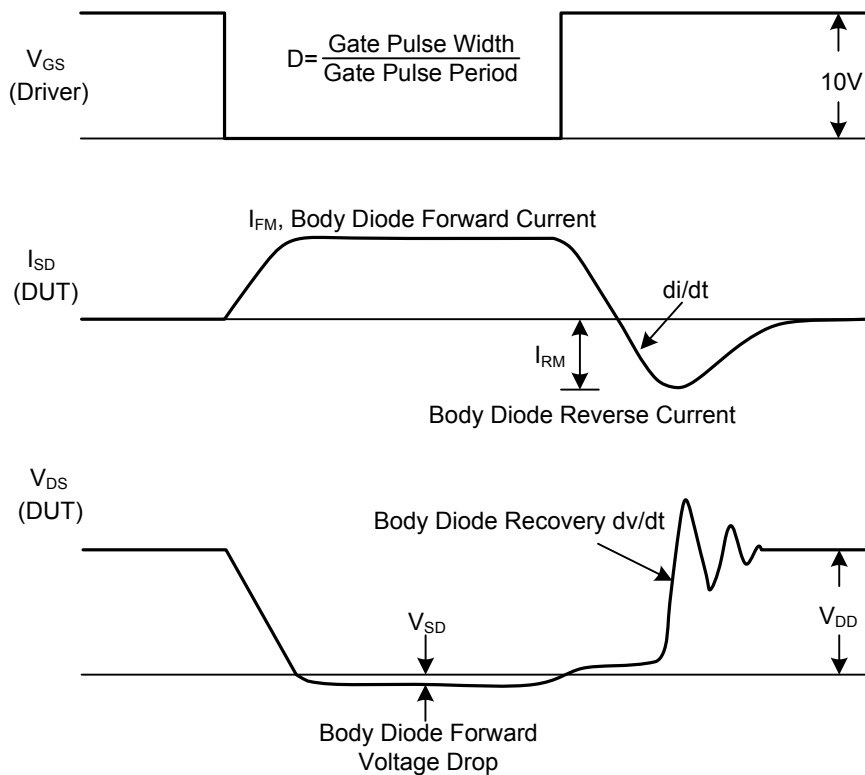
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



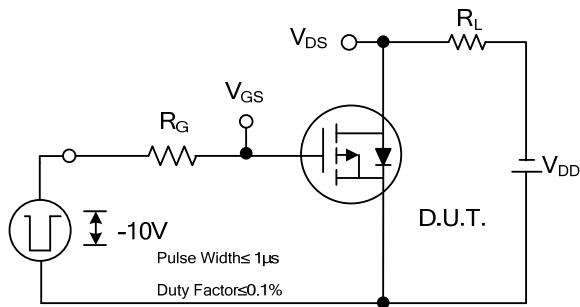
Peak Diode Recovery dv/dt Test Circuit



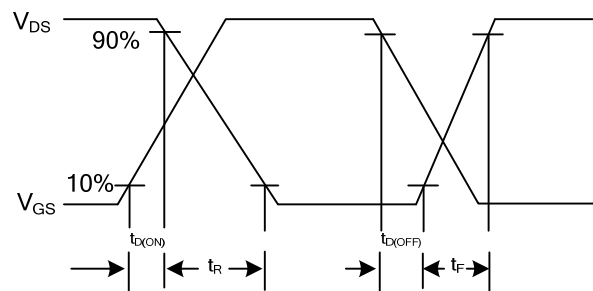
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

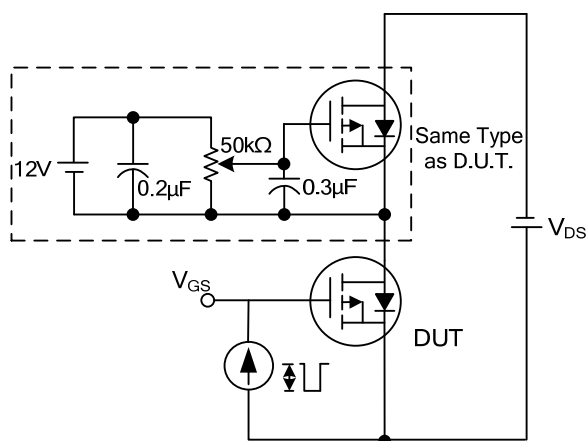
■ TEST CIRCUITS AND WAVEFORMS



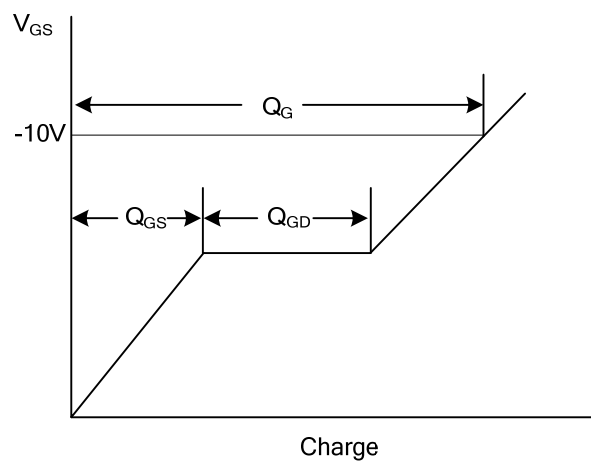
Switching Test Circuit



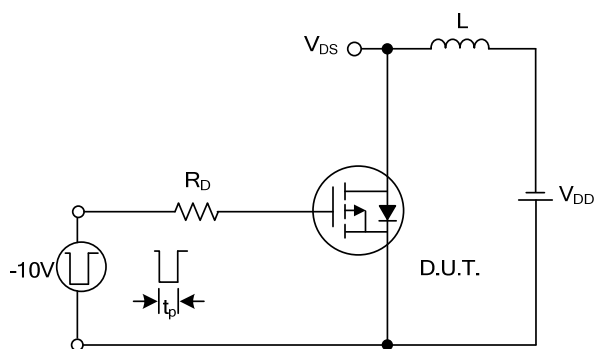
Switching Waveforms



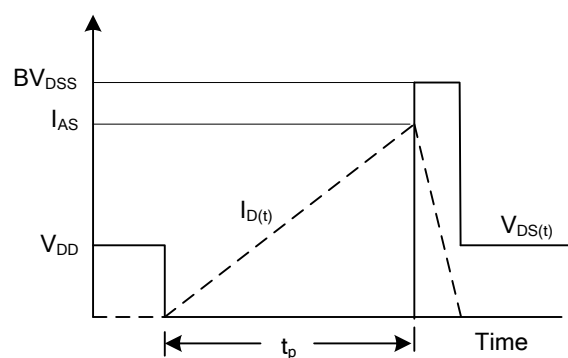
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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