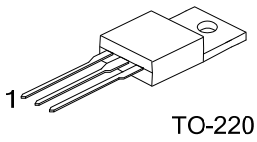
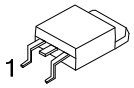
-15A, -100V P-CHANNEL POWER MOSFET



TO-220



TO-252

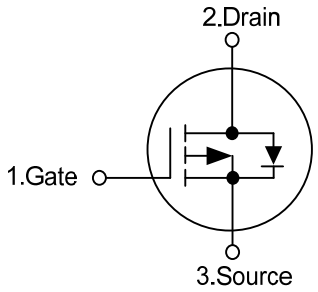
■ DESCRIPTION

The UTC **UTT15P10** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

* $R_{DS(ON)}$ < 260 mΩ @ V_{GS} = -10V, I_D = -7.5A
  $R_{DS(ON)}$ < 400 mΩ @ V_{GS} = -4.5V, I_D = -7.5A
* High Switching Speed

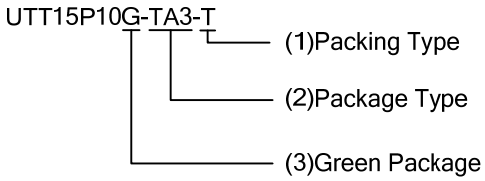
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT15P10L-TA3-T	UTT15P10G-TA3-T	TO-220	G	D	S	Tube
UTT15P10L-TN3-R	UTT15P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

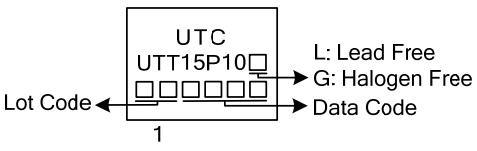


(1) T: Tube, R: Tape Reel

(2) TA3: TO-220, TN3: TO-252

(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}	-100	V
Gate-Source Voltage		V_{GSS}	±25	V
Drain Current	Continuous	I_D	-15	A
	Pulsed	I_{DM}	-60	A
Avalanche Energy (Note 3)	Single Pulsed	E_{AS}	45	mJ
Power Dissipation	TO-220	P_D	90	W
	TO-252		60	
Junction Temperature		T_J	+150	°C
Storage Temperature		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=0.4mH, I_{AS}=-15A, V_{DD}=-50V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD}≤-15A, di/dt≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

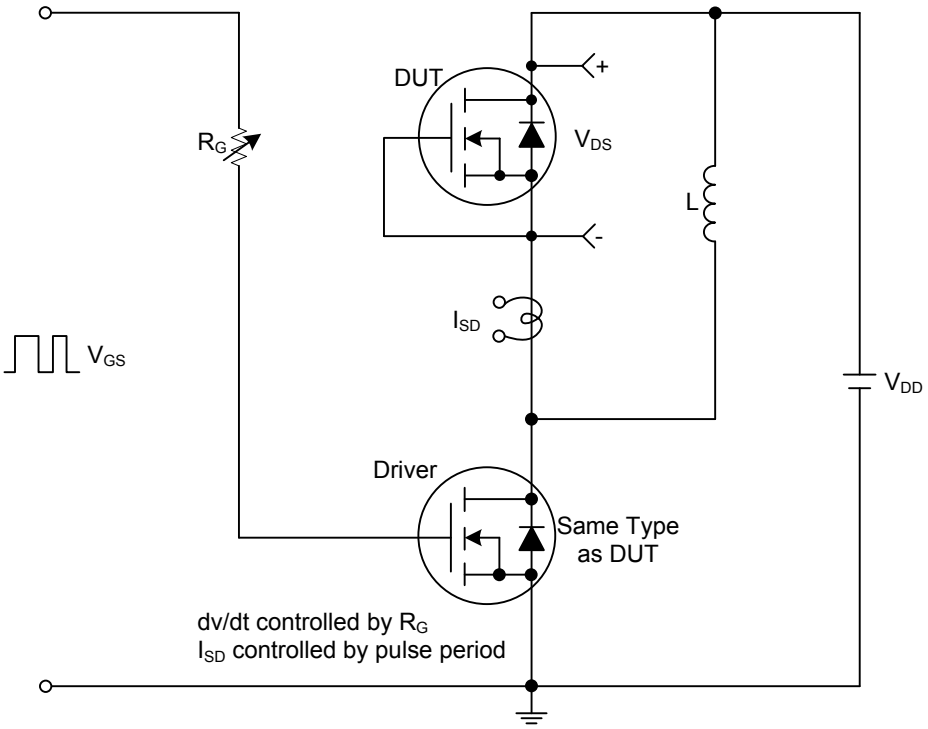
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
Junction to Case	TO-220	θ_{JC}	1.38	°C/W
	TO-252		2.08	

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

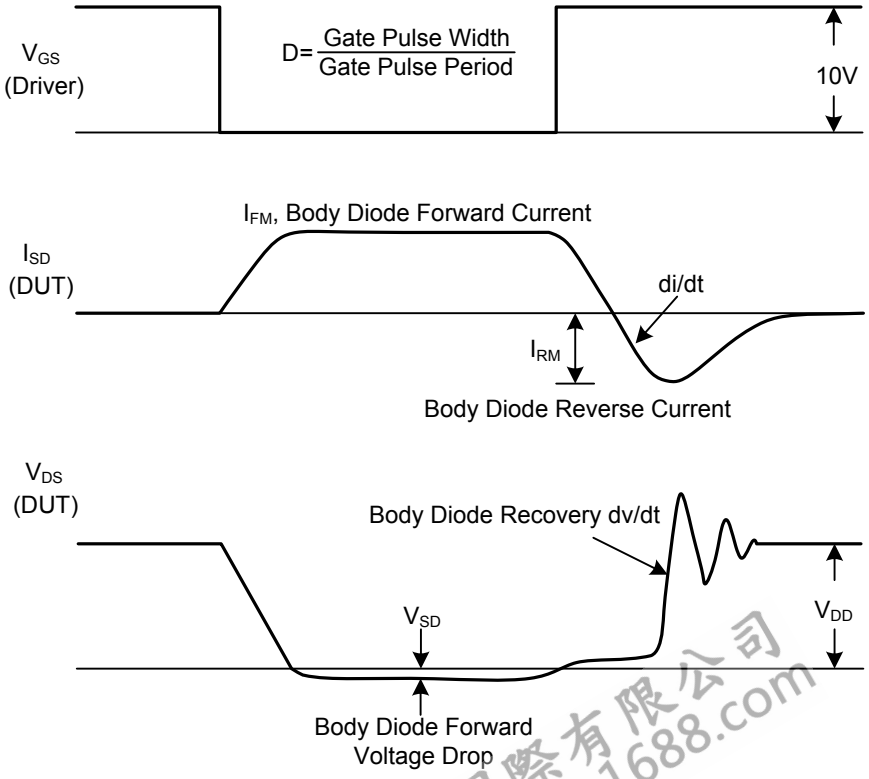
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-100V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+25V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-25V, V_{DS}=0V			-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= -7.5A			260	mΩ
			V_{GS}= -4.5V, I_D= -7.5A			400	mΩ
DYNAMIC PARAMETERS (Note 2)							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz		1200		pF
Output Capacitance		C_{OSS}			64		pF
Reverse Transfer Capacitance		C_{RSS}			56		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=-50V, I_D=-1.3A, V_{GS}=-10V, I_G=-100μA		85		nC
Gate to Source Charge		Q_{GS}			4		nC
Gate to Drain Charge		Q_{GD}			8.8		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=-30V, I_D=-0.5A, R_G=25Ω, V_{GS}=0V		10		ns
Rise Time		t_R			46		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			364		ns
Fall-Time		t_F			180		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-15	A
Maximum Body-Diode Pulsed Current		I_{SM}				-60	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_F=-15A, V_{GS}=0V			-3.0	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=-50A, V_{GS}=0V, dI_F/dt=100A/μs		280		nS
Body Diode Reverse Recovery Charge		Q_{rr}			1385		nC

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

■ TEST CIRCUITS AND WAVEFORMS



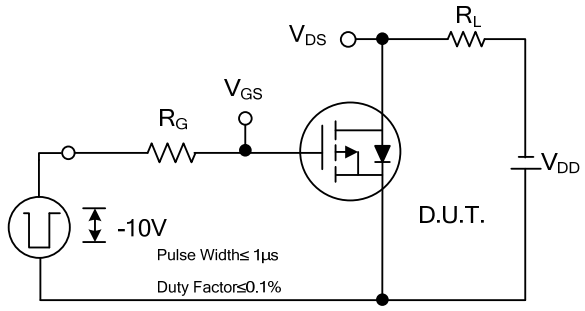
Peak Diode Recovery dv/dt Test Circuit



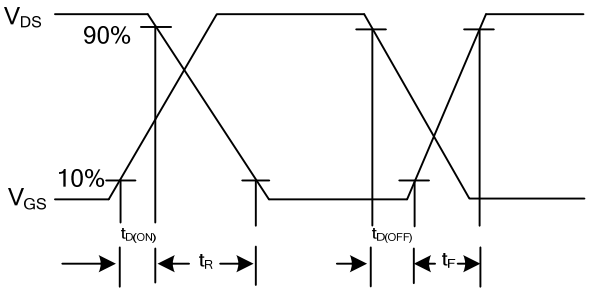
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

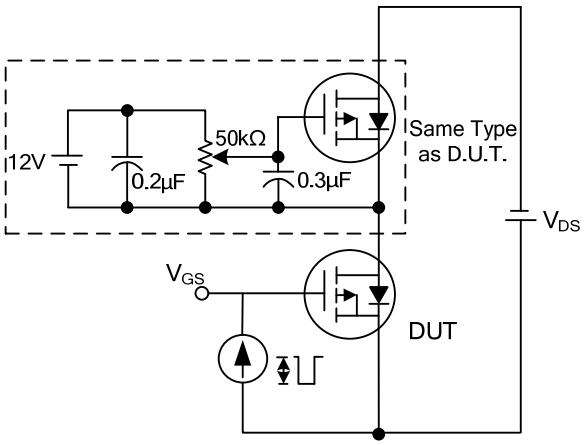
■ TEST CIRCUITS AND WAVEFORMS



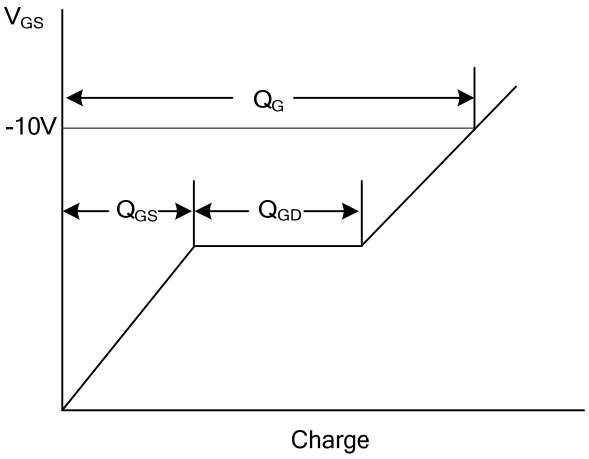
Switching Test Circuit



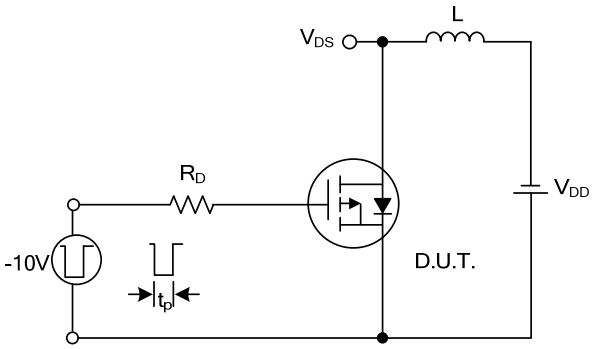
Switching Waveforms



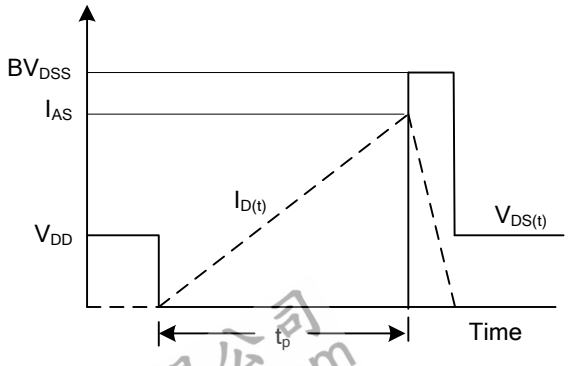
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms