



UTT15P10

Preliminary

Power MOSFET

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

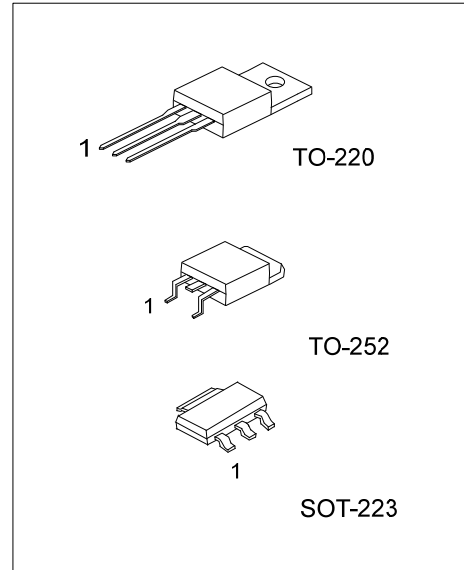
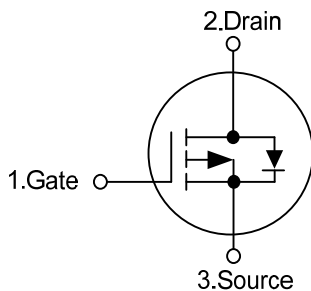
■ DESCRIPTION

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

- * $R_{DS(ON)} \leq 260 \text{ m}\Omega @ V_{GS} = -10\text{V}, I_D = -7.5\text{A}$
- $R_{DS(ON)} \leq 400 \text{ m}\Omega @ V_{GS} = -4.5\text{V}, I_D = -7.5\text{A}$
- * High Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT15P10L-AA3-R	UTT15P10G-AA3-R	SOT-223	G	D	S	Tape Reel
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

<p>UTT15P10G-AA3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) AA3: SOT-223, TA3: TO-220, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	---

■ MARKING

SOT-223	TO-220 / TO-252

■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, 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	SOT-223	P_D	2	W	
	TO-220		90	W	
	TO-252		44.5	W	
Junction Temperature		T_J	+150	$^\circ\text{C}$	
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$	

- 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. $L=0.4\text{mH}$, $I_{AS}=-15\text{A}$, $V_{DD}=-50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$
 4. $I_{SD}\leq -15\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	$^\circ\text{C}/\text{W}$
	TO-220		62.5	$^\circ\text{C}/\text{W}$
	TO-252		110	$^\circ\text{C}/\text{W}$
Junction to Case	SOT-223	θ_{JC}	62.5 (Note.)	$^\circ\text{C}/\text{W}$
	TO-220		1.38	$^\circ\text{C}/\text{W}$
	TO-252		2.8 (Note.)	$^\circ\text{C}/\text{W}$

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

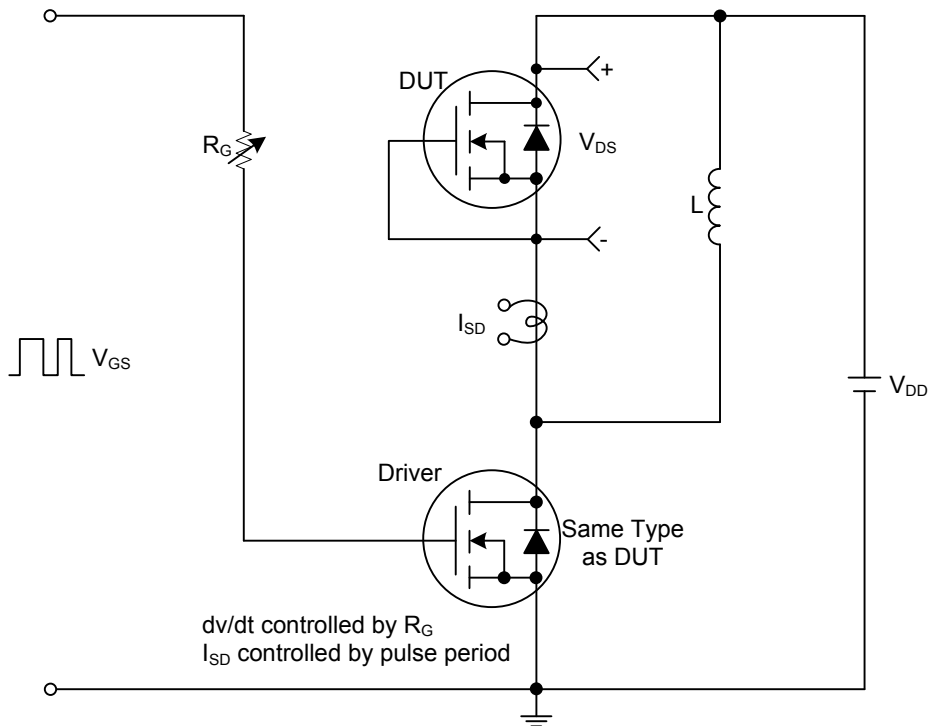
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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}			+100	nA
	Reverse				-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,		280		nS
Body Diode Reverse Recovery Charge	Q _{rr}	dI _F /dt=100A/μs		1385		nC

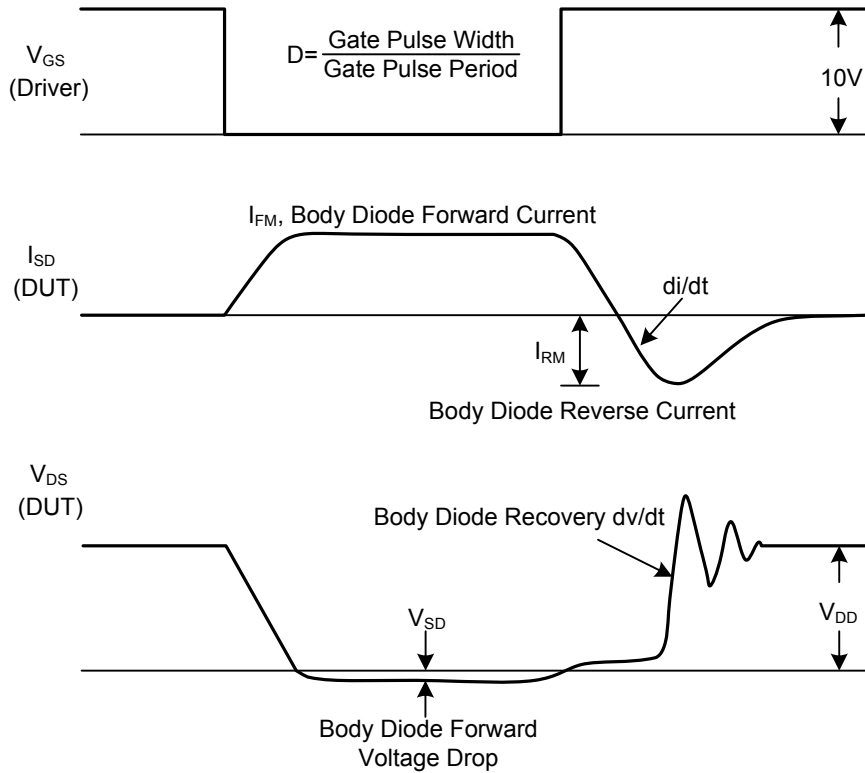
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



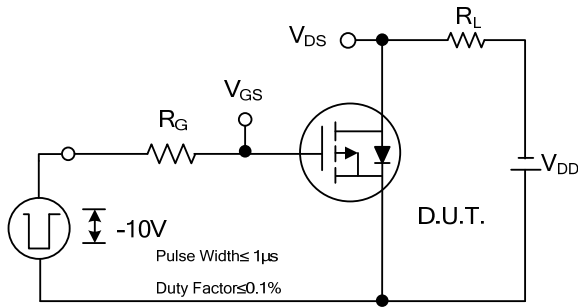
Peak Diode Recovery dv/dt Test Circuit



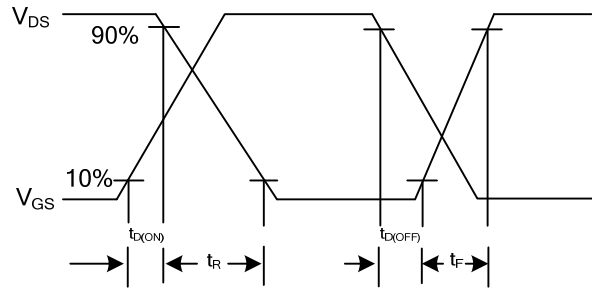
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

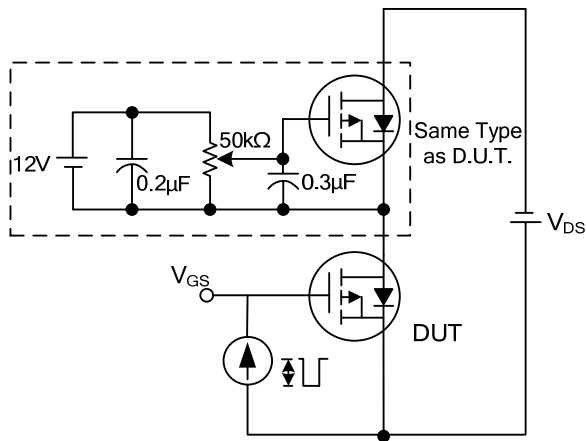
■ TEST CIRCUITS AND WAVEFORMS



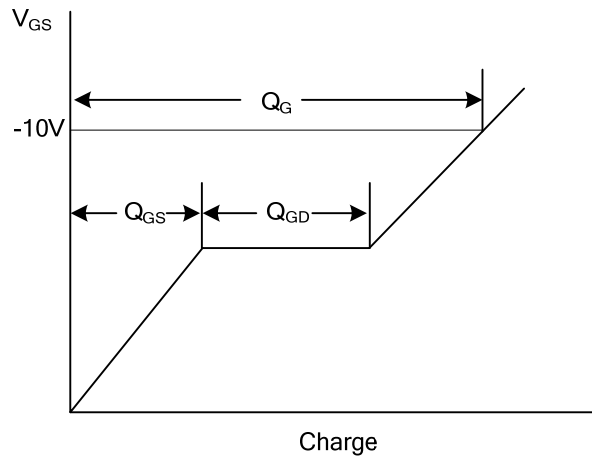
Switching Test Circuit



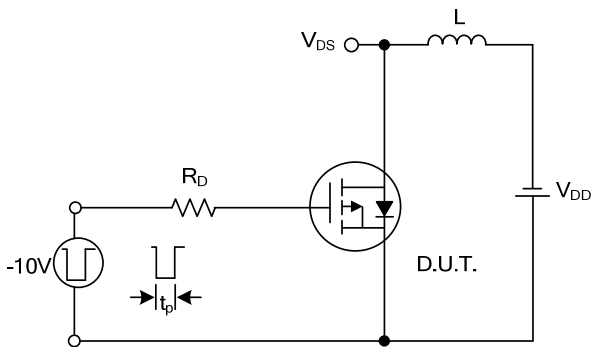
Switching Waveforms



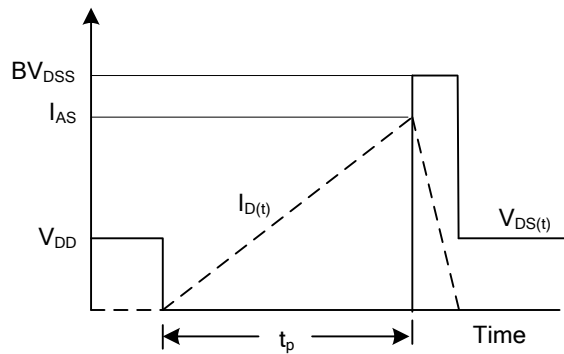
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.