



UTT15P10

Preliminary

Power MOSFET

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

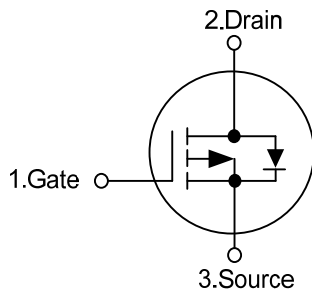
DESCRIPTION

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

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

SYMBOL



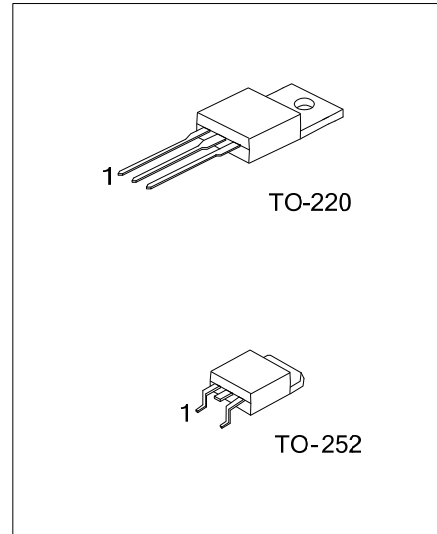
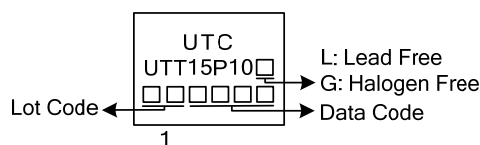
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT15P10L-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-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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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}	±25	V
Drain Current	Continuous	I _D	-15	A
	Pulsed	I _{DM}	-60	A
Avalanche Energy (Note 3)		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	

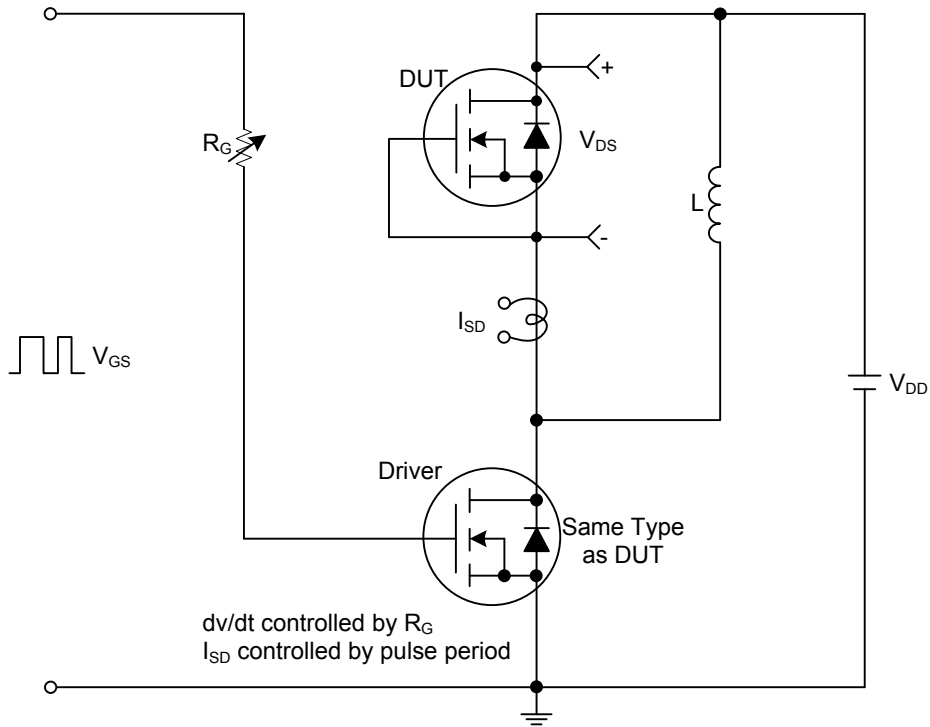
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100\text{V}$, $V_{GS}=0\text{V}$			-1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+25\text{V}$, $V_{DS}=0\text{V}$ $V_{GS}=-25\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1.0		-3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-7.5\text{A}$			260	$\text{m}\Omega$
		$V_{GS}=-4.5\text{V}$, $I_D=-7.5\text{A}$			400	$\text{m}\Omega$
DYNAMIC PARAMETERS (Note 2)						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=-25\text{V}$, $f=1.0\text{MHz}$		1200		pF
Output Capacitance	C_{OSS}			64		pF
Reverse Transfer Capacitance	C_{RSS}			56		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=-50\text{V}$, $I_D=-1.3\text{A}$, $V_{GS}=-10\text{V}$, $I_G=-100\mu\text{A}$		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)	$t_{D(ON)}$	$V_{DD}=-30\text{V}$, $I_D=-0.5\text{A}$, $R_G=25\Omega$, $V_{GS}=0\text{V}$		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}	$I_F=-15\text{A}$, $V_{GS}=0\text{V}$			-3.0	V
Body Diode Reverse Recovery Time (Note 1)	t_{rr}	$I_S=-50\text{A}$, $V_{GS}=0\text{V}$,		280		nS
Body Diode Reverse Recovery Charge	Q_{rr}	$di_F/dt=100\text{A}/\mu\text{s}$		1385		nC

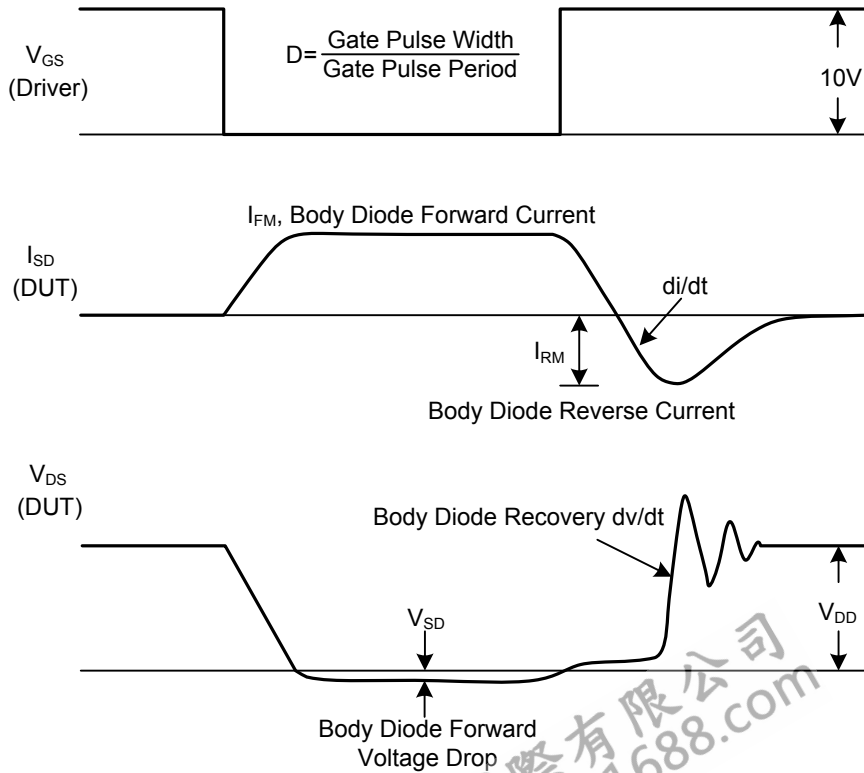
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



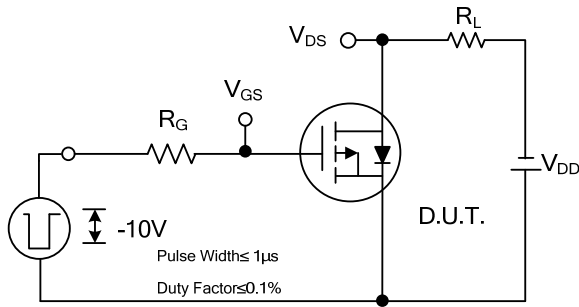
Peak Diode Recovery dv/dt Test Circuit



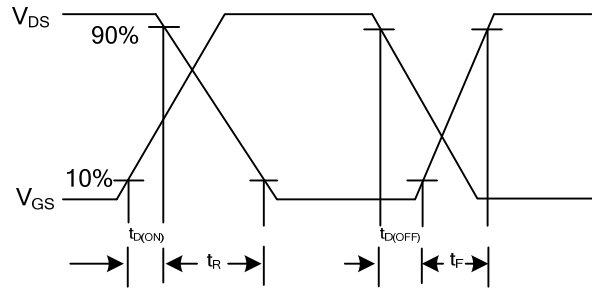
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

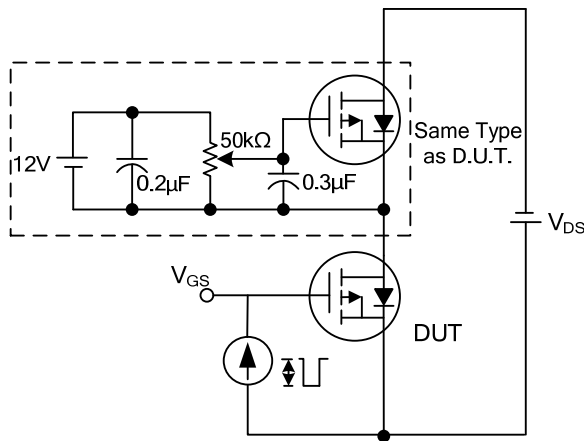
TEST CIRCUITS AND WAVEFORMS



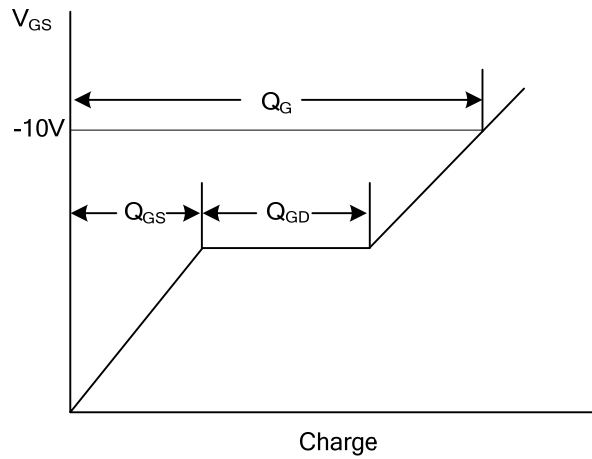
Switching Test Circuit



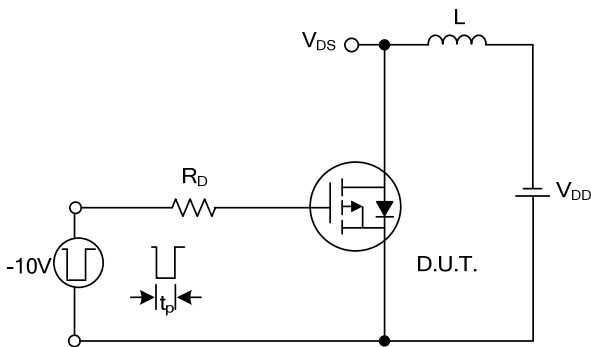
Switching Waveforms



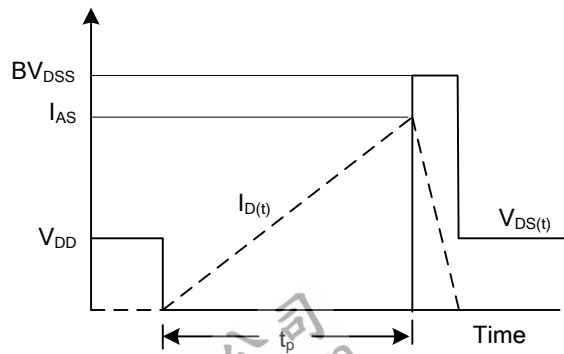
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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