



## UTT15P06

Power MOSFET

### -15A, -60V P-CHANNEL POWER MOSFET

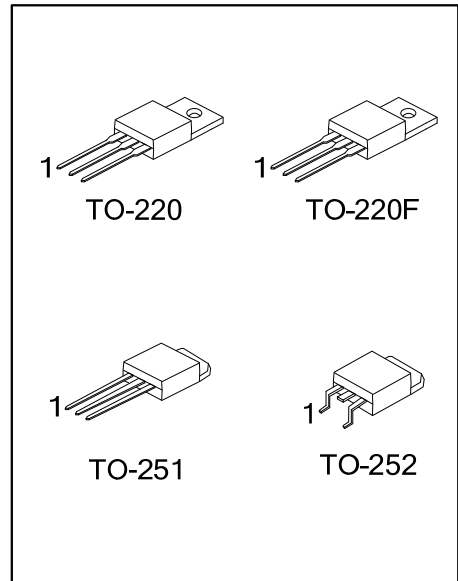
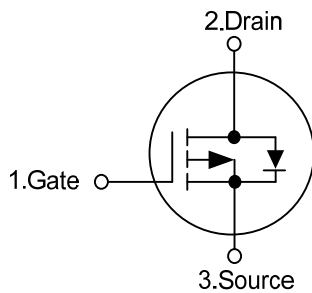
#### DESCRIPTION

The UTC **UTT15P06** 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

- \*  $R_{DS(ON)} \leq 90m\Omega$  @  $V_{GS} = -10V, I_D = -15A$
- \* High Switching Speed

#### SYMBOL



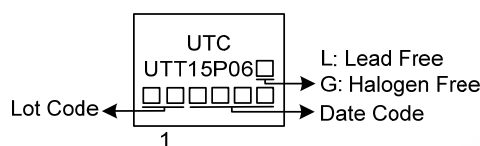
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT15P06L-TA3-T	UTT15P06G-TA3-T	TO-220	G	D	S	Tube
UTT15P06L-TF3-T	UTT15P06G-TF3-T	TO-220F	G	D	S	Tube
UTT15P06L-TM3-T	UTT15P06G-TM3-T	TO-251	G	D	S	Tube
UTT15P06L-TN3-R	UTT15P06G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT15P06G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, 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<sub>c</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	-60	V
Gate-Source Voltage		V <sub>GSS</sub>	±25	V
Drain Current	Continuous	I <sub>D</sub>	-15	A
	Pulsed	I <sub>DM</sub>	-45	A
Power Dissipation	TO-220	P <sub>D</sub>	79	W
	TO-220F		37	
	TO-251/TO-252		31.3	
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-55~+150	°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		SYMBOL	RATINGS	UNIT
Junction to Ambient (Steady state)	TO-220/TO-220F	θ <sub>JA</sub>	62	°C/W
	TO-251/TO-252		110	°C/W
Junction to Case	TO-220	θ <sub>JC</sub>	1.58	°C/W
	TO-220F		3.3	°C/W
	TO-251/TO-252		4 (Note)	°C/W

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

### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

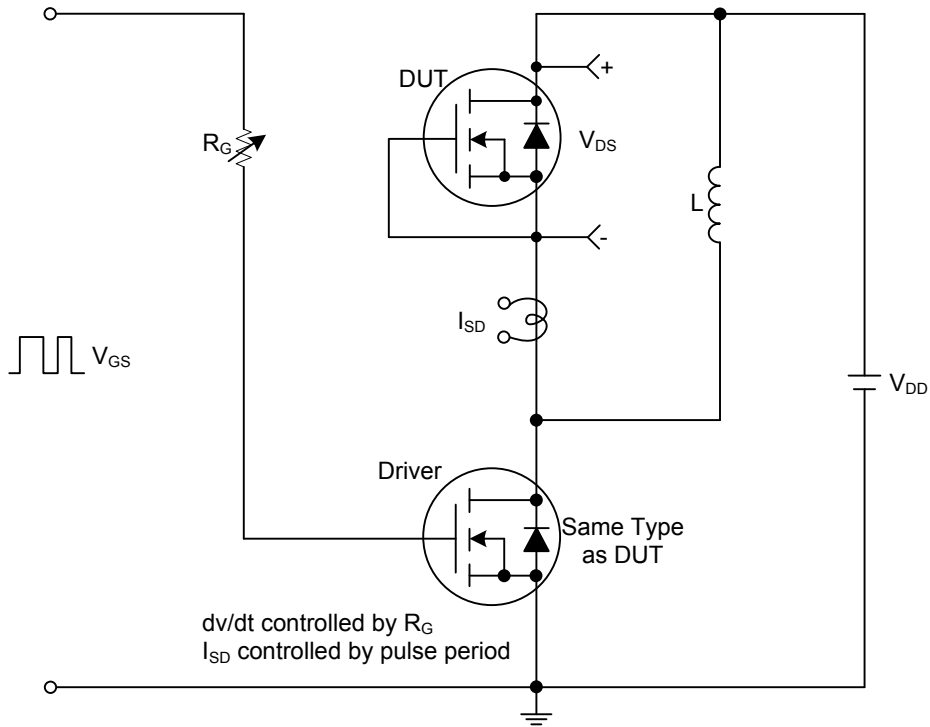
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-60			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V			-1	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+25V, V <sub>DS</sub> =0V			+100	nA
	Reverse		V <sub>GS</sub> =-25V, V <sub>DS</sub> =0V			-100	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0		-3.0	V
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -15A (Note 1)			90	mΩ
<b>DYNAMIC PARAMETERS (Note 2)</b>							
Input Capacitance		C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1.0MHz (Note 2)		1100	2660	pF
Output Capacitance		C <sub>OSS</sub>			115		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			90		pF
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge		Q <sub>G</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-15A (Note 3)		14	27	nC
Gate to Source Charge		Q <sub>GS</sub>			3		nC
Gate to Drain Charge		Q <sub>GD</sub>			8		nC
Turn-ON Delay Time		t <sub>D(ON)</sub>	V <sub>DD</sub> =-30V, I <sub>D</sub> =-1A, R <sub>G</sub> =12.5Ω (Note 3)		16		ns
Rise Time		t <sub>R</sub>			30		ns
Turn-OFF Delay Time		t <sub>D(OFF)</sub>			50		ns
Fall-Time		t <sub>F</sub>			20		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>c</sub>=25°C) (Note 2)</b>							
Maximum Body-Diode Continuous Current		I <sub>S</sub>				-15	A
Maximum Body-Diode Pulsed Current		I <sub>SM</sub>				-45	A
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	I <sub>F</sub> =-15A, V <sub>GS</sub> =0V (Note 1)		-1.0	-1.5	V

Notes: 1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

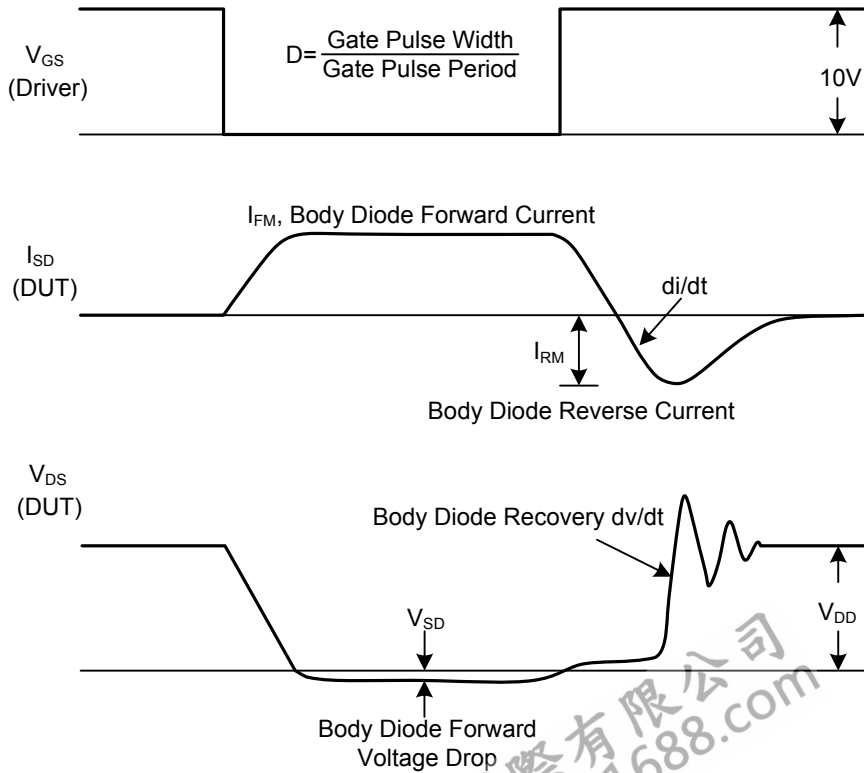
2. Guaranteed by design, not subject to production testing.

3. Independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



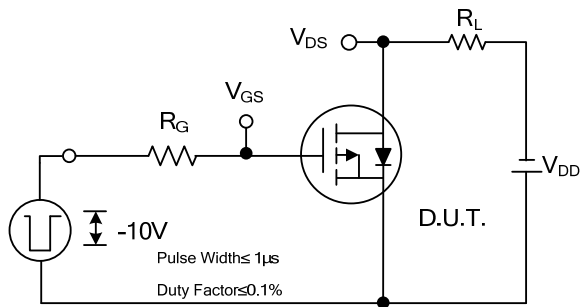
Peak Diode Recovery dv/dt Test Circuit



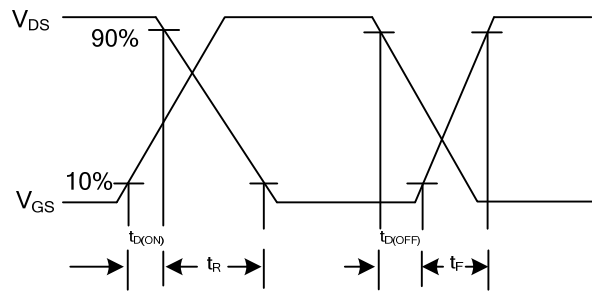
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

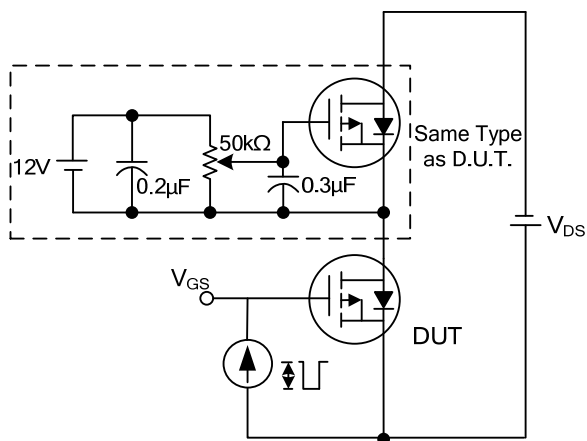
## TEST CIRCUITS AND WAVEFORMS



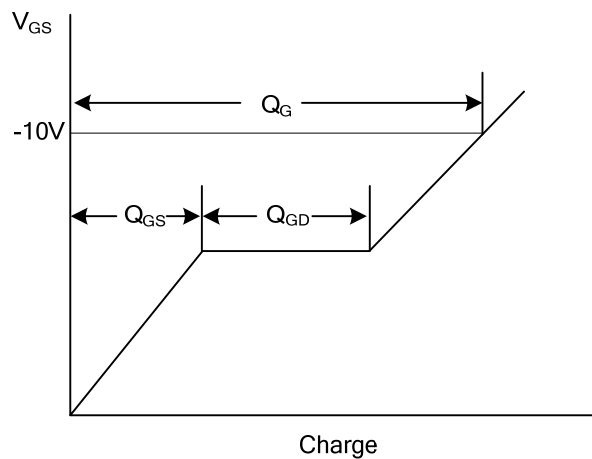
**Switching Test Circuit**



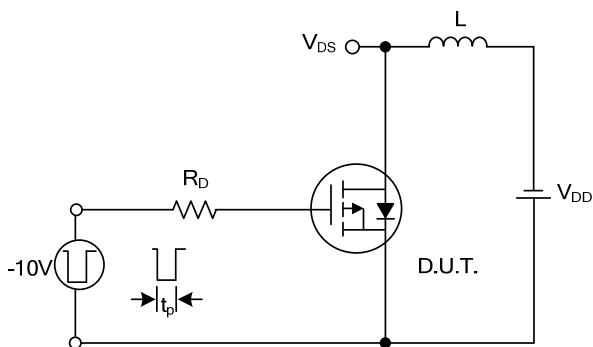
**Switching Waveforms**



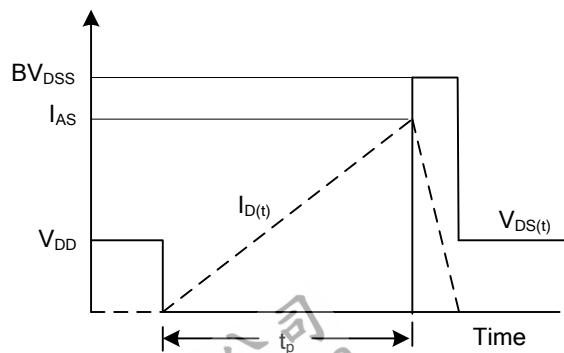
**Gate Charge Test Circuit**



**Gate Charge Waveform**

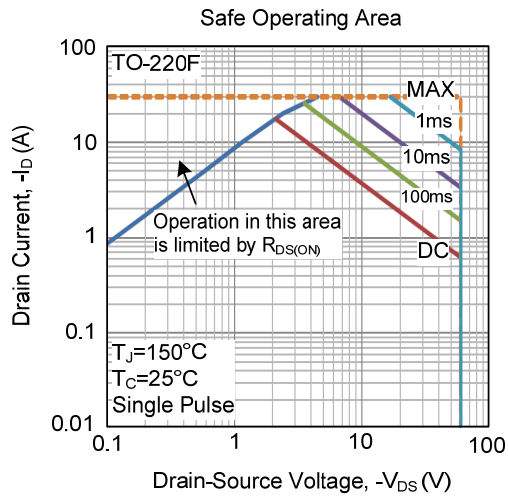


**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

### ■ TYPICAL CHARACTERISTICS



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