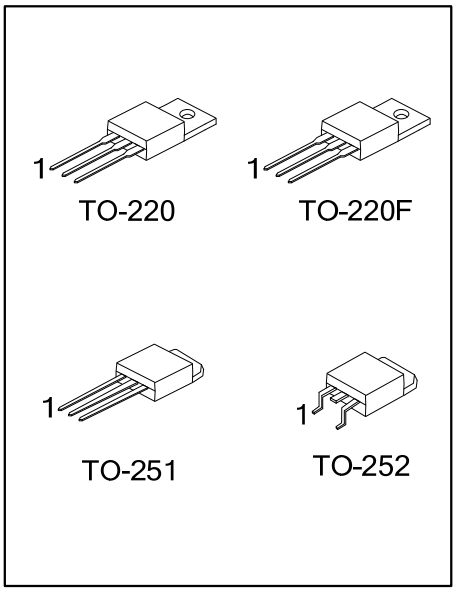
UTT15P06

Power MOSFET

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



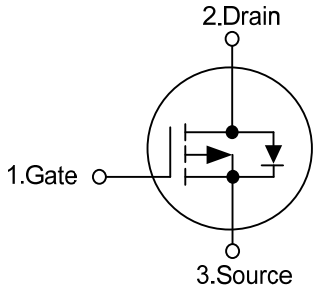
■ DESCRIPTION

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

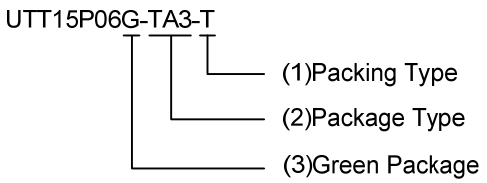
■ SYMBOL



■ ORDERING INFORMATION

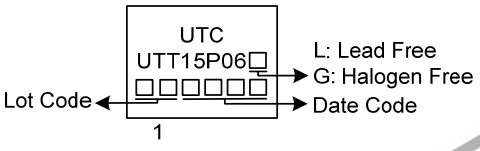
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT15P06L-TA3-T	UTT15P06G-TA3-T	TO-220	G	D	S	Tube
UTT15P06L-TF3-T	UTT15P06G-TF3-T	TO-220F	G	D	S	Tube
UTT15P06L-TM3-T	UTT15P06G-TM3-T	TO-251	G	D	S	Tube
UTT15P06L-TN3-R	UTT15P06G-TN3-R	TO-252	G	D	S	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, 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}	-60	V
Gate-Source Voltage		V_{GSS}	±25	V
Drain Current	Continuous	I_D	-15	A
	Pulsed	I_{DM}	-45	A
Power Dissipation	TO-220	P_D	79	W
	TO-220F		37	
	TO-251/TO-252		31.3	
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-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_{JA}	62	°C/W
	TO-251/TO-252		110	°C/W
Junction to Case	TO-220	θ_{JC}	1.58	°C/W
	TO-220F		3.3	°C/W
	TO-251/TO-252		4 (Note)	°C/W

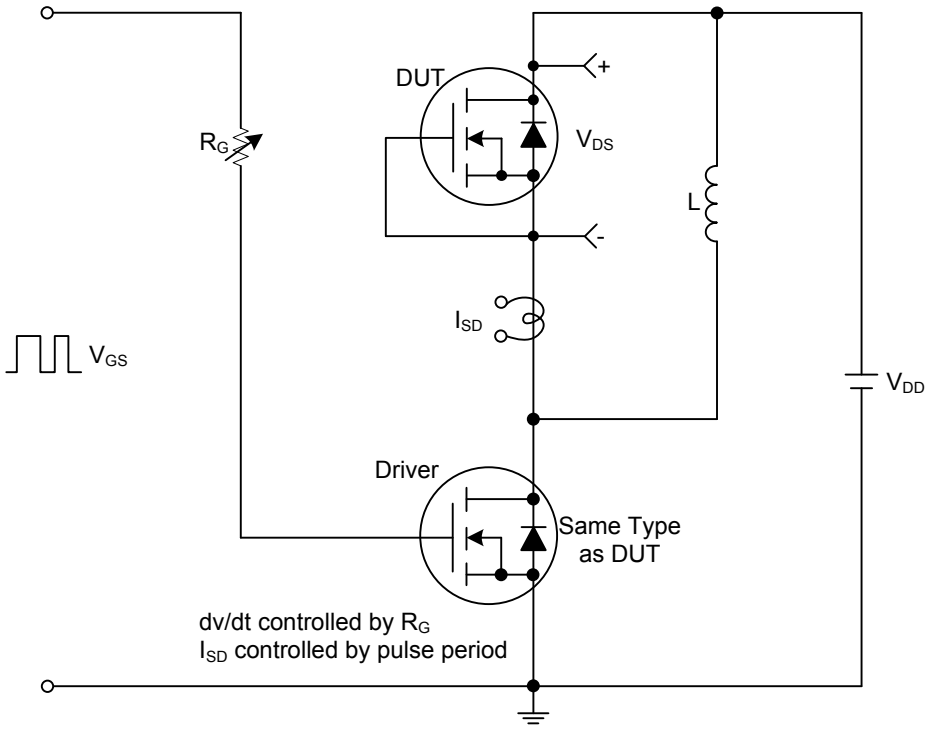
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

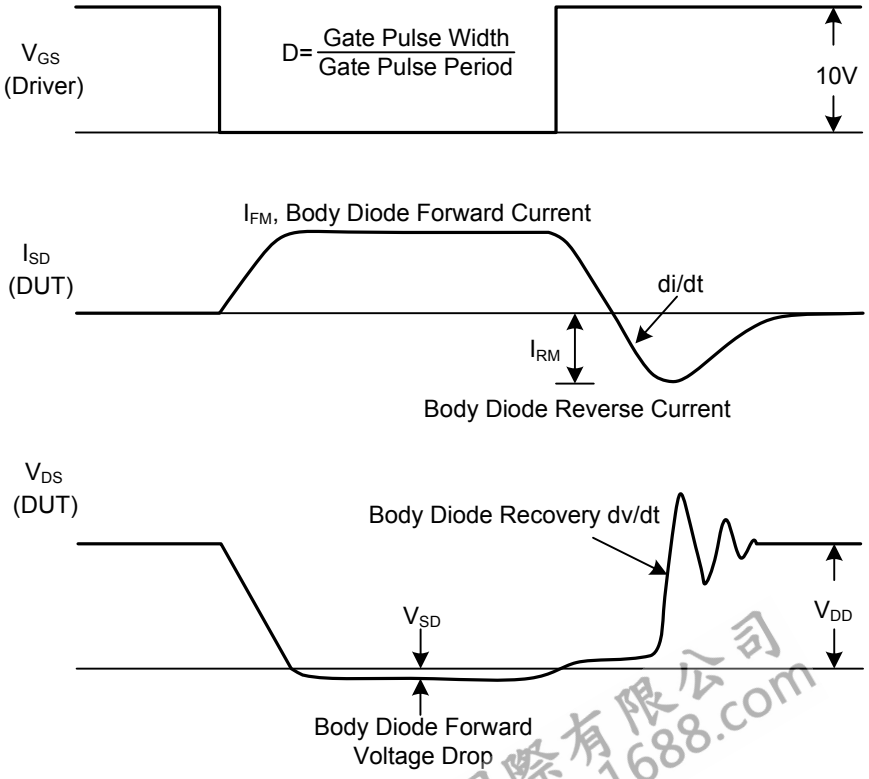
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+25V, V_{DS}=0V			+100	nA
	Reverse		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= -15A (Note 1)			90	mΩ
DYNAMIC PARAMETERS (Note 2)							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz (Note 2)		1100	2660	pF
Output Capacitance		C_{OSS}			115		pF
Reverse Transfer Capacitance		C_{RSS}			90		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=-10V, V_{DS}=-30V, I_D=-15A (Note 3)		14	27	nC
Gate to Source Charge		Q_{GS}			3		nC
Gate to Drain Charge		Q_{GD}			8		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=-30V, I_D=-1A, R_G=12.5Ω (Note 3)		16		ns
Rise Time		t_R			30		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			50		ns
Fall-Time		t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C=25°C) (Note 2)							
Maximum Body-Diode Continuous Current		I_S				-15	A
Maximum Body-Diode Pulsed Current		I_{SM}				-45	A
Drain-Source Diode Forward Voltage		V_{SD}	I_F=-15A, V_{GS}=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



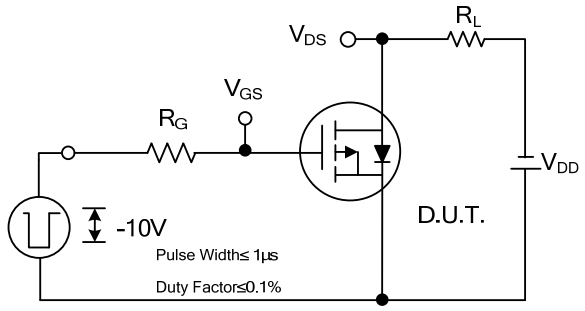
Peak Diode Recovery dv/dt Test Circuit



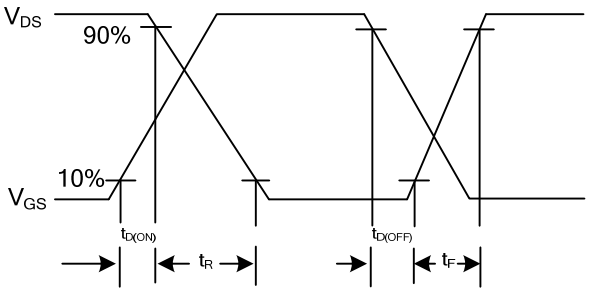
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

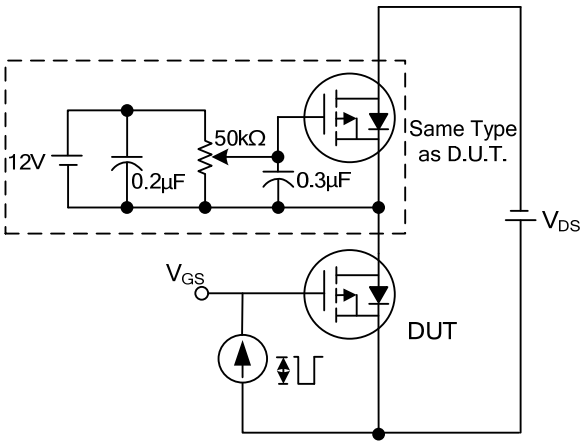
■ TEST CIRCUITS AND WAVEFORMS



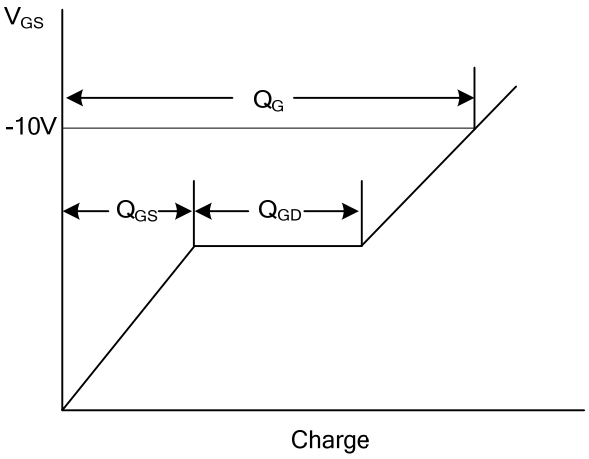
Switching Test Circuit



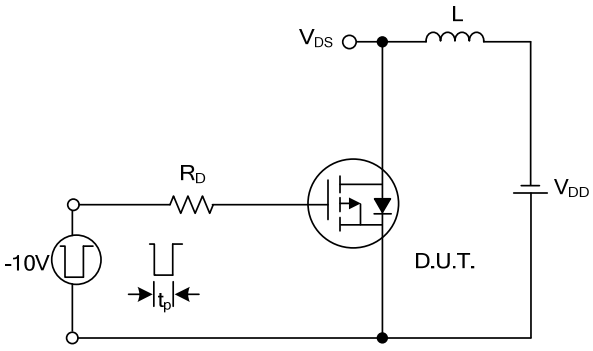
Switching Waveforms



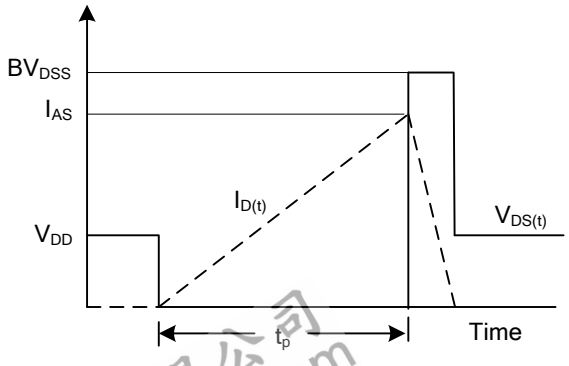
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS