



UTT120P06

Preliminary

Power MOSFET

-120A, -60V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UTT120P06** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance. It can also withstand high energy in the avalanche.

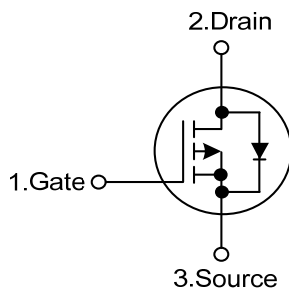
The UTC **UTT120P06** is suitable for low voltage and high speed switching applications.

FEATURES

* $R_{DS(ON)} < 9.0m\Omega @ V_{GS} = -10V, I_D = -30A$

* High Switching Speed

SYMBOL



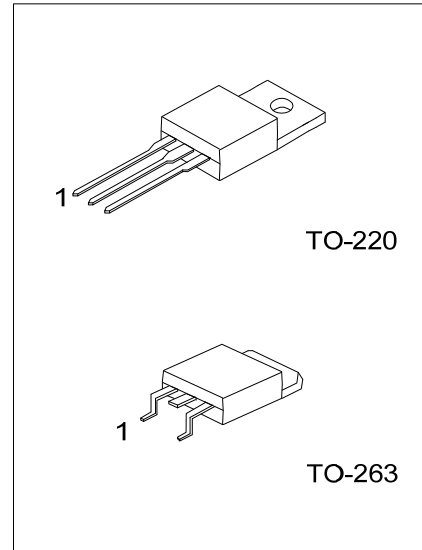
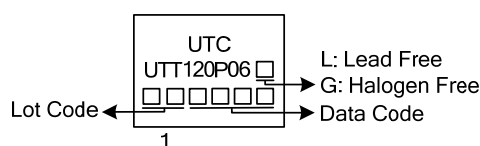
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT120P06L-TA3-T	UTT120P06G-TA3-T	TO-220	G	D	S	Tube
UTT120P06L-TQ2-T	UTT120P06G-TQ2-T	TO-263	G	D	S	Tube
UTT120P06L-TQ2-R	UTT120P06G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>UTT120P06L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
--	---

MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	-60	V	
Gate-Source Voltage		V_{GSS}	± 20	V	
Drain Current	Continuous	I_D	$T_C=25^\circ\text{C}$	-120	A
			$T_C=125^\circ\text{C}$	-95	A
Pulsed		I_{DM}	-480	A	
Single Pulsed Avalanche Energy		$L=-0.1\text{mH}$	E_{AS}	281 (Note 2)	mJ
Power Dissipation		TO-220	P_D	192	W
		TO-263		178	
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. Duty cycle $\leq 1\%$.

■ THERMAL DATA

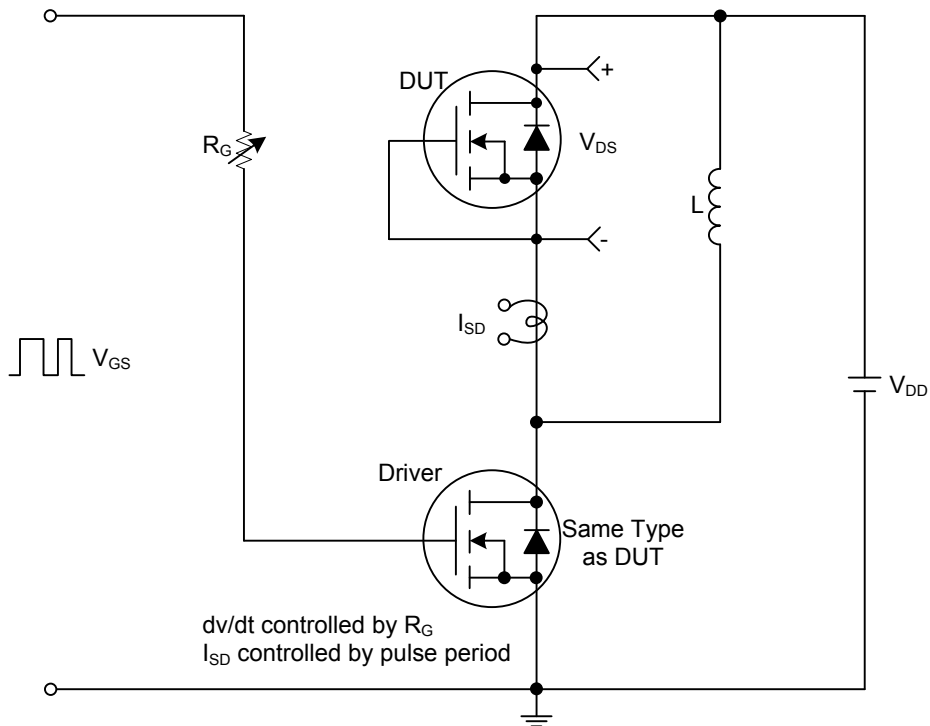
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.65	$^\circ\text{C}/\text{W}$
	TO-263		0.70	

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

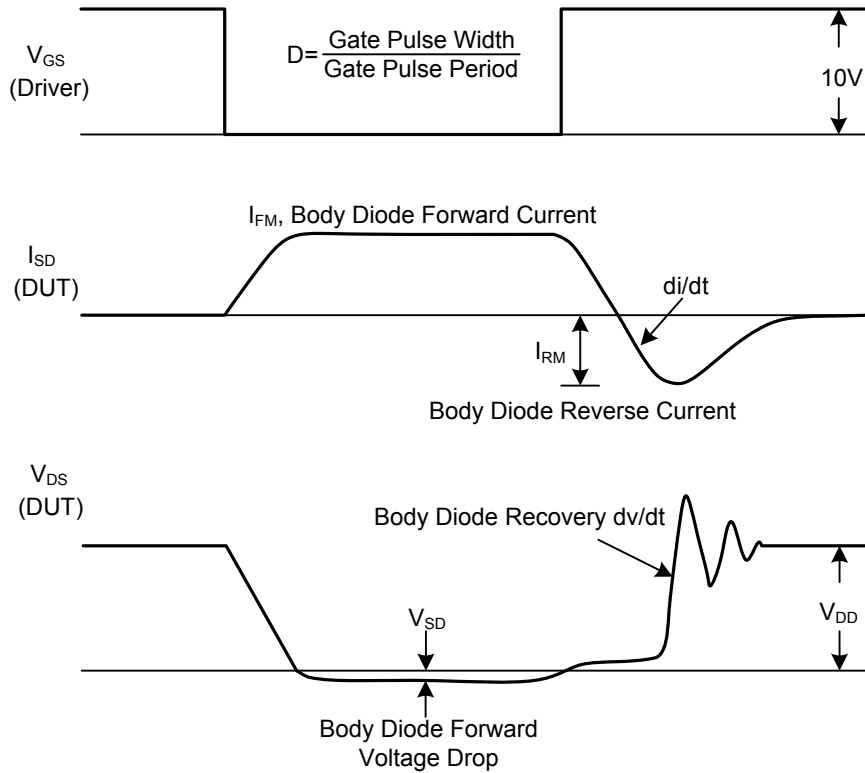
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=-250\mu\text{A}, V_{GS}=0\text{V}$	-60			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=-60\text{V}, V_{GS}=0\text{V}$			-1	μA
			$V_{DS}=-60\text{V}, V_{GS}=0\text{V}, T_C=125^\circ\text{C}$			-50	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20\text{V}, V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-2.0		-4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=-10\text{V}, I_D=-30\text{A}$			9.0	m Ω
DYNAMIC PARAMETERS							
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}		0			
Reverse Transfer Capacitance		C_{RSS}		790			
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{DS}=-48\text{V}, V_{GS}=-10\text{V}, I_D=-80\text{A}$		120		nC
Gate to Source Charge		Q_{GS}			30		
Gate to Drain Charge		Q_{GD}			70		
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-0.5\text{A}, R_G=25\Omega$		230		ns
Rise Time		t_R			300		
Turn-OFF Delay Time		$t_{D(OFF)}$			2600		
Fall-Time		t_F			650		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-120	A
Maximum Body-Diode Pulsed Current		I_{SM}				-480	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=-120\text{A}, V_{GS}=0\text{V}$		-1.0	-1.5	V
Body Diode Reverse Recovery Time		t_{rr}	$I_F=-85\text{A}, dI_F/dt=100\text{A}/\mu\text{s}$		65	100	ns
Body Diode Reverse Recovery Charge		Q_{RR}			0.14	0.32	

Note: Pulse test, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS



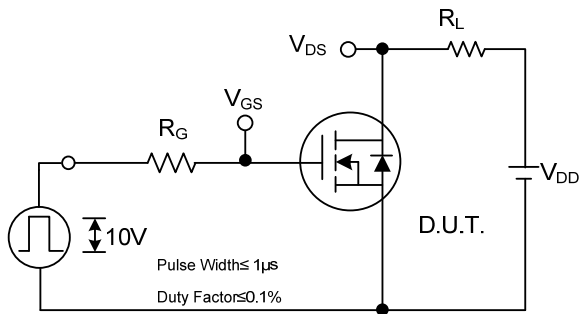
Peak Diode Recovery dv/dt Test Circuit



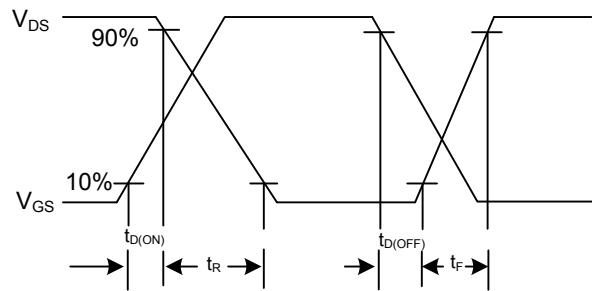
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

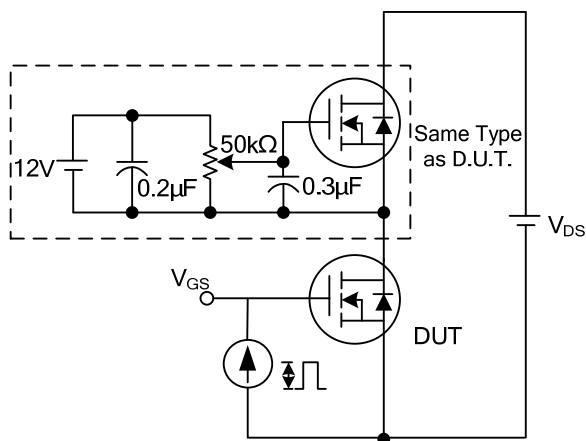
■ TEST CIRCUITS AND WAVEFORMS



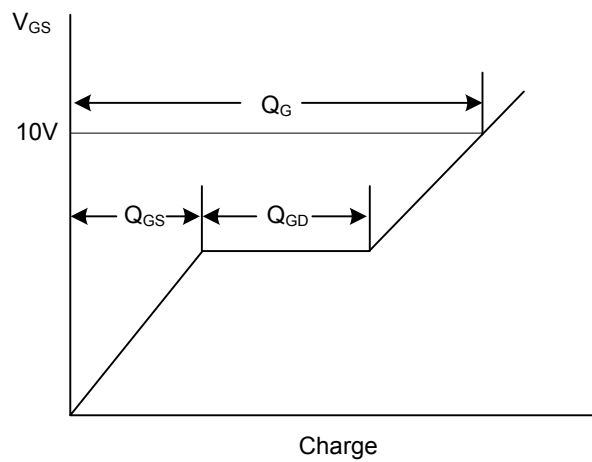
Switching Test Circuit



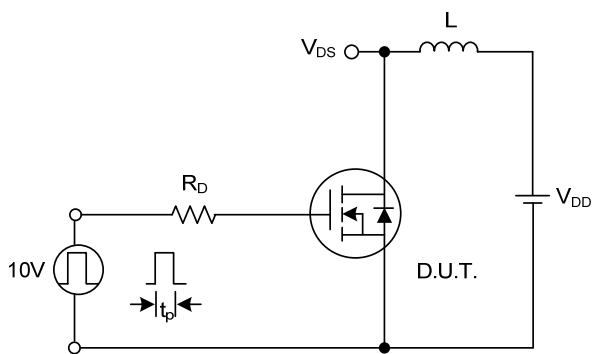
Switching Waveforms



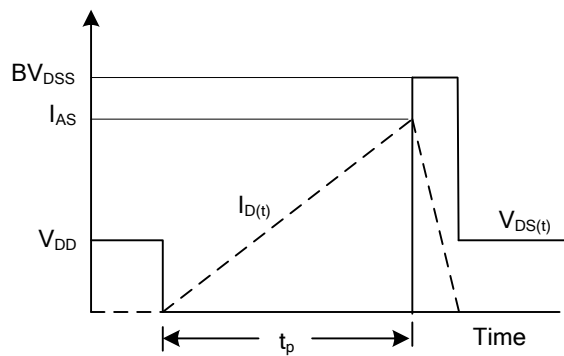
Gate Charge Test Circuit



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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.