



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.

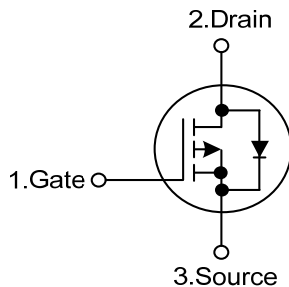
The UTC **UTT120P06** is suitable for low voltage and high speed switching applications.

FEATURES

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

* High Switching Speed

SYMBOL



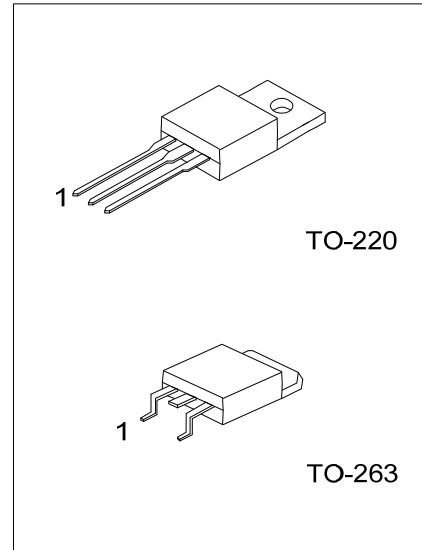
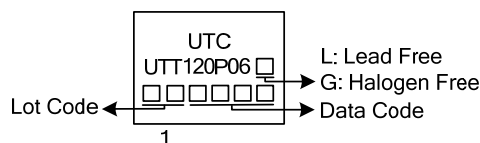
ORDERING INFORMATION

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>
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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}	±20	V	
Drain Current	Continuous	I _D	T _C =25°C	-120	A
			T _C =125°C	-95	A
Pulsed		I _{DM}	-480	A	
Single Pulsed Avalanche Energy		L=-0.1mH	E _{AS}	281 (Note 2)	mJ
Power Dissipation		TO-220	P _D	192	W
		TO-263		178	
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. Duty cycle ≤ 1%.

■ THERMAL DATA

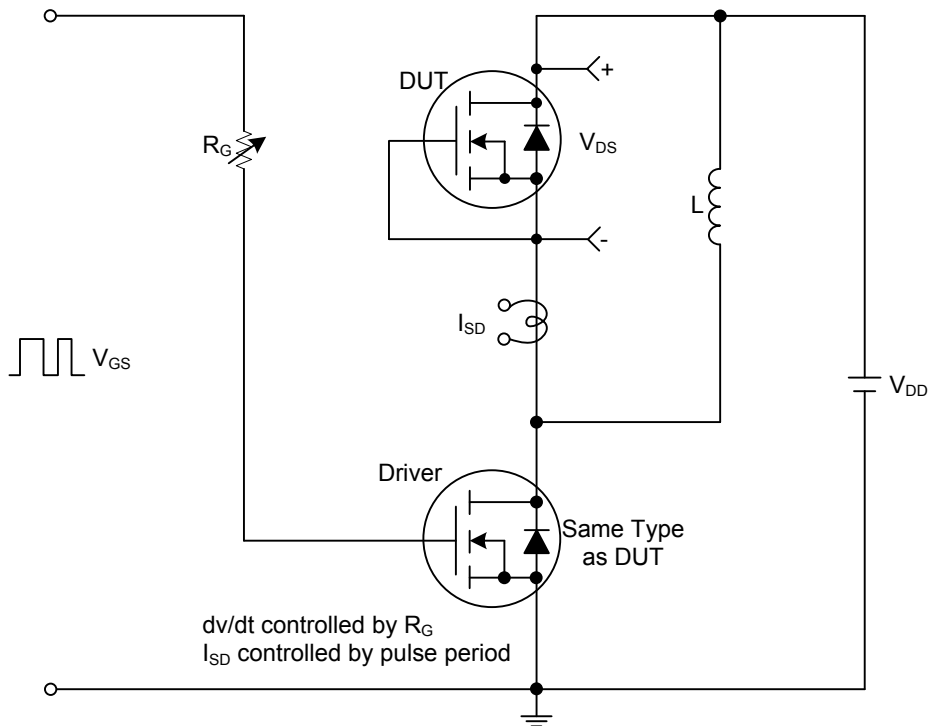
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ _{JA}	62	°C/W
Junction to Case	TO-220	θ _{JC}	0.65	°C/W
	TO-263		0.70	

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

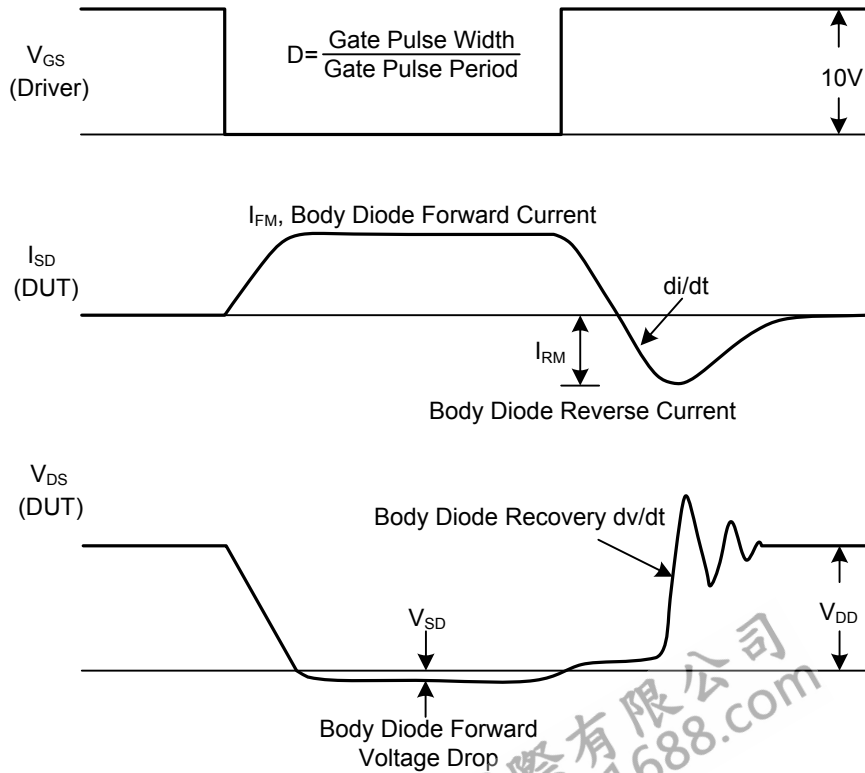
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =-250μA, V _{GS} =0V	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
			V _{DS} =-60V, V _{GS} =0V, T _C =125°C			-50	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-2.0		-4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-30A			9.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		1200		pF
Output Capacitance		C _{OSS}			790		
Reverse Transfer Capacitance		C _{RSS}			650		
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-80A		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} =-30V, V _{GS} =-10V, I _D =-0.5A, R _G =25Ω		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 =-120A, V _{GS} =0V		-1.0	-1.5	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =-85A, dI _F /dt=100A/μs		65	100	ns
Body Diode Reverse Recovery Charge		Q _{RR}			0.14	0.32	

Note: Pulse test, pulse width ≤ 300μs, duty cycle ≤ 2%.

■ TEST CIRCUITS AND WAVEFORMS



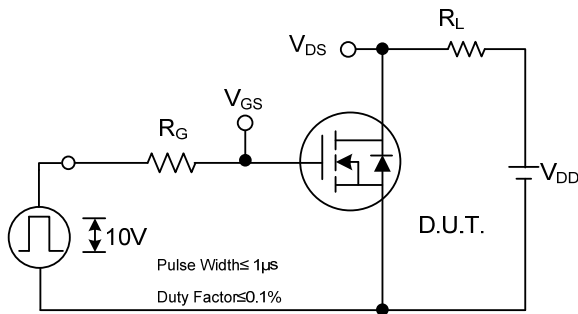
Peak Diode Recovery dv/dt Test Circuit



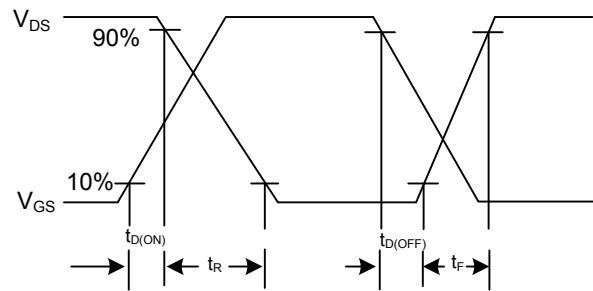
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

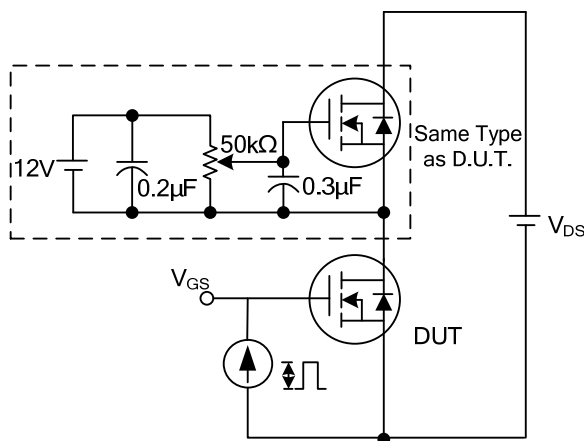
TEST CIRCUITS AND WAVEFORMS



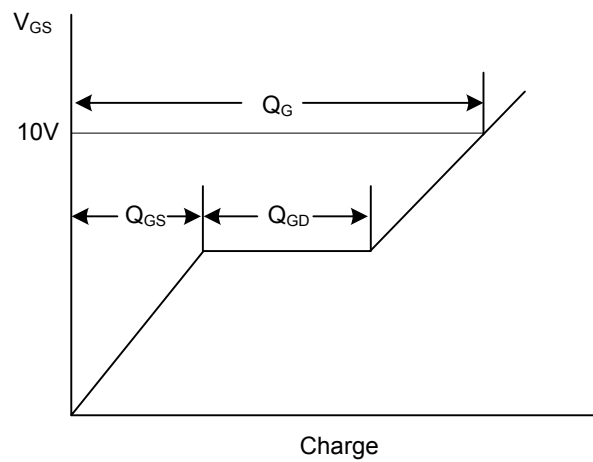
Switching Test Circuit



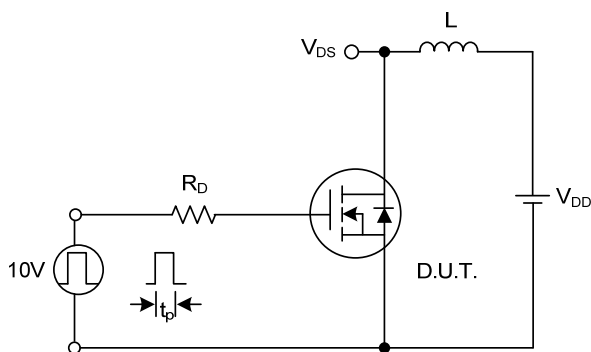
Switching Waveforms



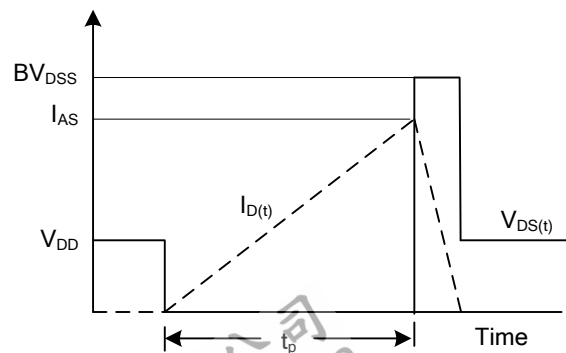
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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