



## UTT50P06

Power MOSFET

### -50A, -60V P-CHANNEL (D-S) POWER MOSFET

#### DESCRIPTION

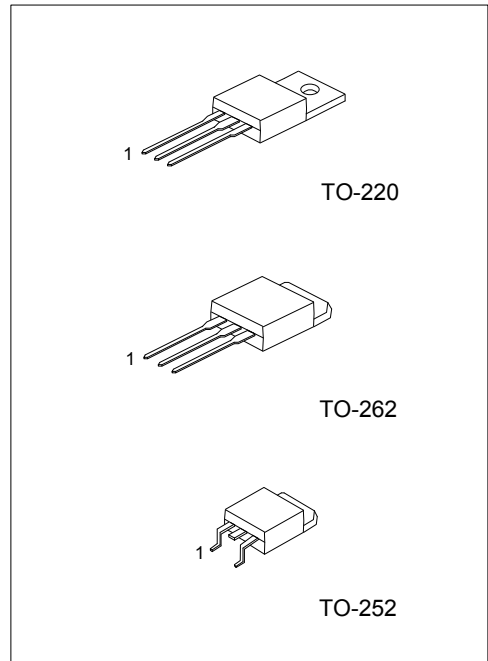
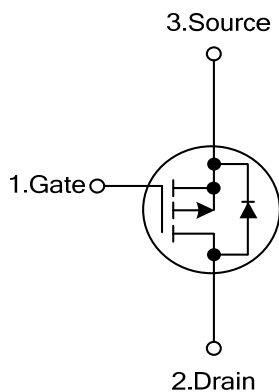
The UTC **UTT50P06** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and it can also withstand high energy in the avalanche.

This UTC **UTT50P06** is suitable for load switch, etc.

#### FEATURES

- \*  $V_{DS} = -60V$
- \*  $I_D = -50A$
- \*  $R_{DS(ON)} = 0.012\Omega @ V_{GS} = -10V, I_D = -17A$
- \* High Switching Speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT50P06L-TA3-T	UTT50P06G-TA3-T	TO-220	G	D	S	Tube
UTT50P06L-TN3-T	UTT50P06G-TN3-T	TO-252	G	D	S	Tube
UTT50P06L-TN3-R	UTT50P06G-TN3-R	TO-252	G	D	S	Tape Reel
UTT50P06L-T2Q-R	UTT50P06G-T2Q-R	TO-262	G	D	S	Tube

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

<p>UTT50P06L-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TN3: TO-252, T2Q: TO-262</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			$V_{DSS}$	-60	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous ( $T_J=175^\circ\text{C}$ )	$T_C=25^\circ\text{C}$	$I_D$	-50 (Note 5)	A
		$T_C=125^\circ\text{C}$		-27.5	A
	Pulsed		$I_{DM}$	-80	A
Avalanche Current			$I_{AR}$	-50	A
Single Pulse Avalanche Energy (Note 2)		L=0.1mH	$E_{AS}$	125	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	TO-220	$P_D$	113 (Note 4)	W
		TO-252		50	W
		TO-262		113	W
	$T_A=25^\circ\text{C}$	TO-220		2.5 (Note 3, 4)	W
		TO-252		1.13	W
		TO-262		2.5	W
Junction Temperature			$T_J$	-55~+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  $\leq 1\%$ .
3. When Mounted on 1" square PCB (FR-4 material).
4. See SOA curve for voltage derating.
5. Package limited.

■ THERMAL CHARACTERISTICS

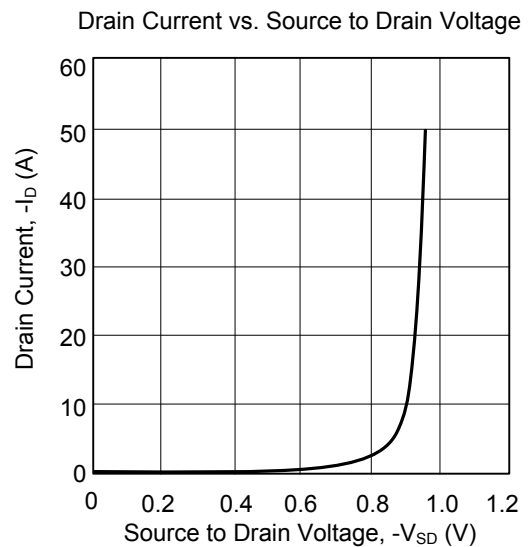
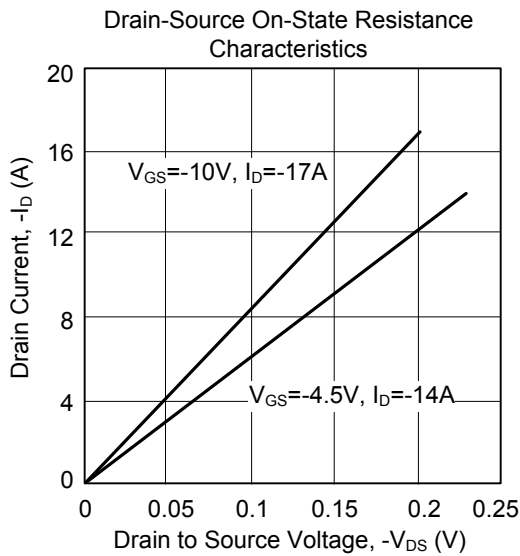
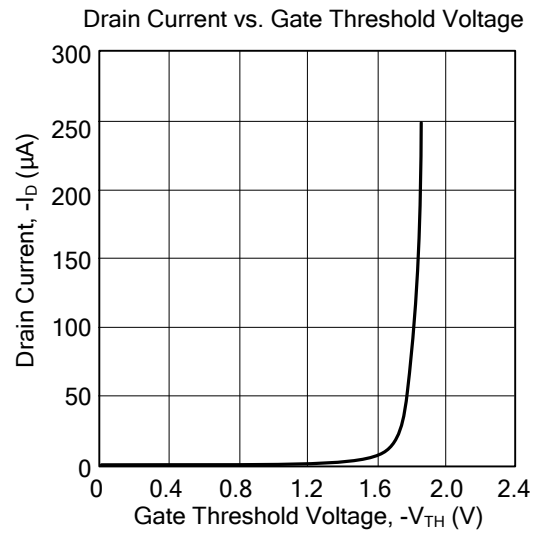
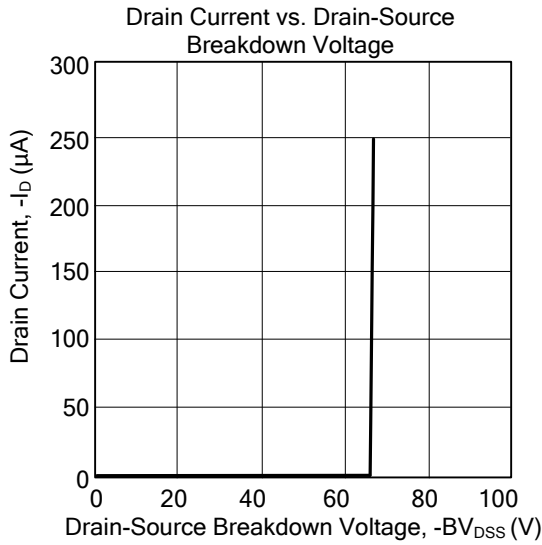
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	$\theta_{JA}$	50	$^\circ\text{C/W}$
	TO-252		110	$^\circ\text{C/W}$
	TO-262		50	$^\circ\text{C/W}$
Junction to Case	TO-220	$\theta_{JC}$	1.1	$^\circ\text{C/W}$
	TO-252		2.5	$^\circ\text{C/W}$
	TO-262		1.1	$^\circ\text{C/W}$

■ 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>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-60			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1		-3	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V			-1	μA
		V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			-50	
		V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C			-100	
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>			+100	nA
	Reverse					
<b>ON CHARACTERISTICS</b>						
Static Drain-Source On-State Resistance (Note 1)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-17A		0.012	0.015	Ω
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-50A, T <sub>J</sub> =125°C			0.025	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-50A, T <sub>J</sub> =150°C			0.028	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-14A			0.020	
Forward Transconductance (Note 1)	g <sub>FS</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> =-17A		61		S
On State Drain Current (Note 1)	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-50			A
<b>DYNAMIC PARAMETERS (Note 2)</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1MHz		4950		pF
Output Capacitance	C <sub>OSS</sub>			480		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			405		pF
<b>SWITCHING PARAMETERS (Note 2, 3)</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-50A		110	165	nC
Gate to Source Charge	Q <sub>GS</sub>			19		nC
Gate to Drain Charge	Q <sub>GD</sub>			28		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-30V, R <sub>L</sub> =0.6Ω, I <sub>D</sub> ≈ -50A, V <sub>GEN</sub> =-10V, R <sub>G</sub> =6Ω		15	23	ns
Rise Time	t <sub>R</sub>			70	105	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			175	260	ns
Fall-Time	t <sub>F</sub>			175	260	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>				-50	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				-80	A
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>F</sub> =-50A, V <sub>GS</sub> =0V		-1.0	-1.6	V
Body Diode Reverse Recovery Time	t <sub>RR</sub>	I <sub>F</sub> =-50A, dI/dt=100A/μs		45	70	ns

- Notes: 1. Pulse test; pulse width≤300μs, duty cycle≤2%.  
 2. Guaranteed by design, not subject to production testing.  
 3. Independent of operating temperature.

### TYPICAL CHARACTERISTICS



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