



UTT50P06

Preliminary

Power MOSFET

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

DESCRIPTION

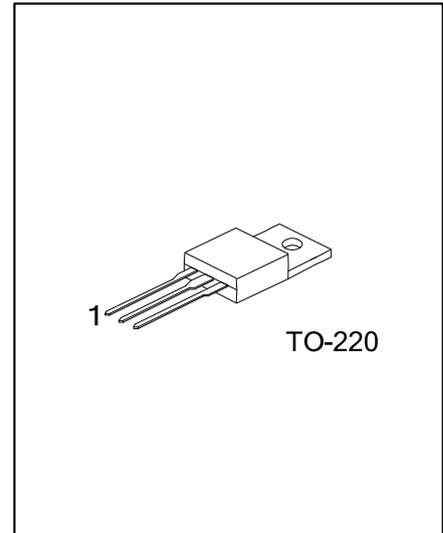
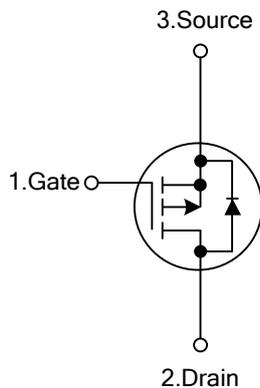
The UTC **UTT50P06** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and it can also withstand high energy in the avalanche.

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

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

UTT50P06L-TA3-T 	(1) Packing Type (2) Package Type (3) Lead Free	(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free
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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}	± 20	V	
Drain Current	Continuous ($T_J=175^\circ\text{C}$)	I_D	$T_C=25^\circ\text{C}$	-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)		$L=0.1\text{mH}$	E_{AS}	125	mJ
Power Dissipation		P_D	$T_C=25^\circ\text{C}$	113 (Note 4)	W
			$T_A=25^\circ\text{C}$	2.5 (Note 3, 4)	
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 (Note 3)	$t \leq 10\text{s}$	θ_{JA}	18	$^\circ\text{C/W}$
	Steady State		50	
Junction to Case		θ_{JC}	1.1	

■ 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}	V _{GS} =0V, I _D =-250μA	-60			V
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-1		-3	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
		V _{DS} =-60V, V _{GS} =0V, T _J =125°C			-50	
		V _{DS} =-60V, V _{GS} =0V, T _J =150°C			-100	
Gate- Source Leakage Current	Forward	I _{GSS}				nA
	Reverse					
						-100
						nA
ON CHARACTERISTICS						
Static Drain-Source On-State Resistance (Note 1)	R _{DS(ON)}	V _{GS} =-10V, I _D =-17A		0.012	0.015	Ω
		V _{GS} =-10V, I _D =-50A, T _J =125°C			0.025	
		V _{GS} =-10V, I _D =-50A, T _J =150°C			0.028	
		V _{GS} =-4.5V, I _D =-14A			0.020	
Forward Transconductance (Note 1)	g _{FS}	V _{DS} =-15V, I _D =-17A		61		S
On State Drain Current (Note 1)	I _{D(ON)}	V _{GS} =-10V, V _{DS} =-5V	-50			A
DYNAMIC PARAMETERS (Note 2)						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1MHz		4950		pF
Output Capacitance	C _{OSS}			480		pF
Reverse Transfer Capacitance	C _{RSS}			405		pF
SWITCHING PARAMETERS (Note 2, 3)						
Total Gate Charge	Q _G	V _{GS} =-10V, V _{DS} =-30V, I _D =-50A		110	165	nC
Gate to Source Charge	Q _{GS}			19		nC
Gate to Drain Charge	Q _{GD}			28		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-30V, R _L =0.6Ω, I _D ≈ -50A, V _{GEN} =-10V, R _G =6Ω		15	23	ns
Rise Time	t _R			70	105	ns
Turn-OFF Delay Time	t _{D(OFF)}			175	260	ns
Fall-Time	t _F			175	260	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C=25°C) (Note 2)						
Maximum Body-Diode Continuous Current	I _S				-50	A
Maximum Body-Diode Pulsed Current	I _{SM}				-80	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _F =-50A, V _{GS} =0V		-1.0	-1.6	V
Body Diode Reverse Recovery Time	t _{RR}	I _F =-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.

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