



## UTT100P03

Preliminary

Power MOSFET

### 100A, 30V P-CHANNEL POWER MOSFET

#### DESCRIPTION

The UTC **UTT100P03** 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.

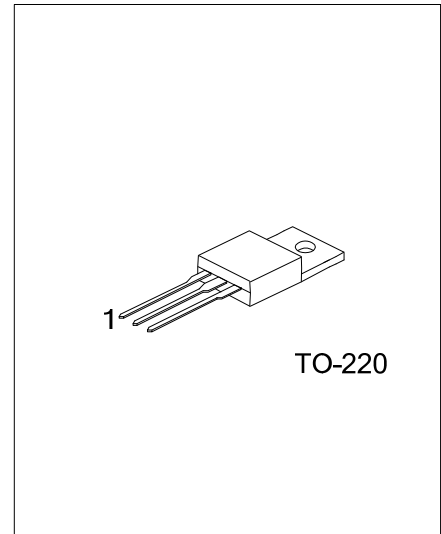
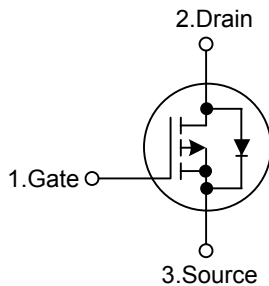
The UTC **UTT100P03** is suitable for low voltage and high speed switching applications

#### FEATURES

\*  $R_{DS(ON)}=3.3m\Omega @ V_{GS}=-10V, I_D=-80A$

\* High Switching Speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT100P03L-TA3-T	UTT100P03G-TA3-T	TO-220	G	D	S	Tube

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

UTT100P03L-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<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V <sub>DSS</sub>	-30	V	
Gate-Source Voltage		V <sub>GSS</sub>	-16/+5	V	
Drain Current	Continuous (Note 2)	I <sub>D</sub>	T <sub>C</sub> =25°C, V <sub>GS</sub> =-10V	-100	A
			T <sub>C</sub> =100°C, V <sub>GS</sub> =-10V	-100 (Note 3)	A
	Pulsed (Note 3)	I <sub>DM</sub>	T <sub>C</sub> =25°C	-400	A
Single Pulsed Avalanche Energy		I <sub>D</sub> =-80A	E <sub>AS</sub>	450	mJ
Power Dissipation		T <sub>C</sub> =25°C	P <sub>D</sub>	200	W
Junction Temperature		T <sub>J</sub>	+175	°C	
Storage Temperature		T <sub>STG</sub>	-55~+175	°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. Current is limited by bondwire; with a θ<sub>JC</sub> = 0.65 °C/W the chip is able to carry I<sub>D</sub>=-195A at 25°C.

3. Defined by design. Not subject to production test.

■ THERMAL DATA (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	62	°C/W
Junction to Case	θ <sub>JC</sub>	0.65	°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>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-30			V	
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C		-0.1	-1	μA	
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C (Note 1)		-10	-100	μA	
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+16V, V <sub>DS</sub> =0V		+10	+100	nA
	Reverse		V <sub>GS</sub> =-16V, V <sub>DS</sub> =0V		-10	-100	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-475μA	-1	-1.5	-2.1	V	
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-50A		4.8	7.6	mΩ	
		V <sub>GS</sub> =-10, I <sub>D</sub> =-80A		3.3	4.3	mΩ	
<b>DYNAMIC PARAMETERS (Note 1)</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1.0MHz		7150	9300	pF	
Output Capacitance	C <sub>OSS</sub>			2150	2800	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>			1650	2500	pF	
<b>SWITCHING PARAMETERS (Note 1)</b>							
Total Gate Charge	Q <sub>G</sub>	V <sub>DD</sub> =-24V, V <sub>GS</sub> =0~-10V, I <sub>D</sub> =-80A		150	200	nC	
Gate to Source Charge	Q <sub>GS</sub>			25	33	nC	
Gate to Drain Charge	Q <sub>GD</sub>			55	82.5	nC	
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-50A, R <sub>G</sub> =6Ω		30		ns	
Rise Time	t <sub>R</sub>			45		ns	
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			200		ns	
Fall-Time	t <sub>F</sub>			180		ns	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Body-Diode Continuous Current	I <sub>S</sub>	T <sub>A</sub> = 25°C (Note 1)			-100	A	
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>	T <sub>A</sub> = 25°C (Note 1)			-400	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-80A, V <sub>GS</sub> =0V	-0.6	-1	-1.2	V	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	V <sub>R</sub> =-15V, I <sub>F</sub> =-50A,		50		ns	
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	dI <sub>F</sub> /dt=100A/μs (Note 1)		55		nC	

Notes: 1. Defined by design. Not subject to production test.

2. Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70 μm thick) copper area for drain connection. PCB is vertical in still air.

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