



**UTT40P04**

Preliminary

*Power MOSFET*

**40V, 50A P-CHANNEL  
POWER MOSFET**

■ DESCRIPTION

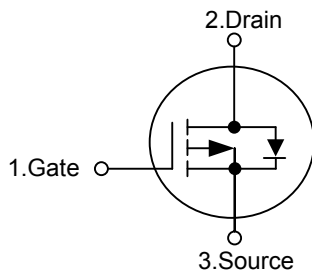
The UTC **UTT40P04** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance. It can also withstand high energy in the avalanche.

This UTC **UTT40P04** is suitable for Inverter or Power supplies.

■ FEATURES

\*  $R_{DS(ON)} < 12.3m\Omega @ V_{GS} = -10V, I_D = -12.7A,$   
 $R_{DS(ON)} < 18m\Omega @ V_{GS} = -4.5V, I_D = -10.4A$

■ SYMBOL

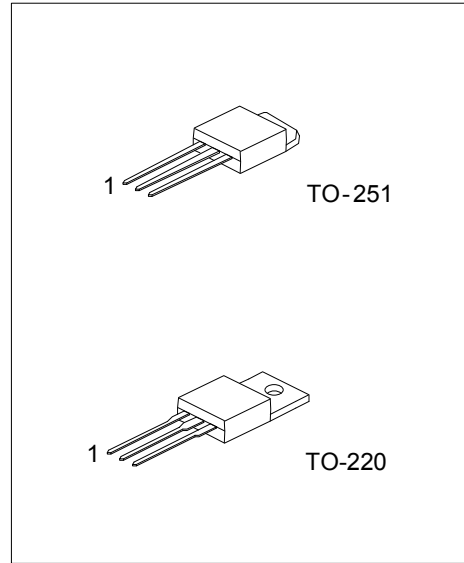


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT40P04L-TA3-T	UTT40P04G-TA3-T	TO-220	G	D	S	Tube
UTT40P04L-TM3-T	UTT40P04G-TM3-T	TO-251	G	D	S	Tube

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

<p>UTT40P04L-TA3-T</p> <p>(1) Packing Type          (2) Package Type          (3) Lead Free</p>	<p>(1) T: Tube          (2) TA3: TO-220, TM3: TO-251          (3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	-40	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Drain Current	Continuous	I <sub>D</sub>	-50	A
	Package limited		-58	A
Pulsed		I <sub>DM</sub>	-100	A
Single Pulsed Avalanche Energy (Note 2)		E <sub>AS</sub>	337	mJ
Power Dissipation	T <sub>C</sub> =25°C	TO-220	125	W
		TO-251	55	
	T <sub>A</sub> =25°C	TO-220	2	
		TO-251	1.1	
Junction Temperature		T <sub>J</sub>	-55~+150	°C
Storage Temperature		T <sub>STG</sub>	-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. Starting T<sub>J</sub> = 25°C, L = 3mH, I<sub>AS</sub> = 15A, V<sub>DD</sub> = 40V, V<sub>GS</sub> = 10V.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ <sub>JA</sub>	62.5	°C/W
	TO-251		110	
Junction to Case	TO-220	θ <sub>JC</sub>	1	°C/W
	TO-251		2.27	

■ 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	-40			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-32V, V <sub>GS</sub> =0V			-1	μA
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>			+100	nA
	Reverse				V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	-100
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1	-1.8	-3	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-12.7A		10.1	12.3	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10.4A		14.5	18.0	mΩ
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-12.7A, T <sub>J</sub> =125°C		15.3	18.7	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-20V, f=1.0MHz		2085	2775	pF
Output Capacitance	C <sub>OSS</sub>			360	480	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			210	310	pF
Gate Resistance	R <sub>G</sub>	f=1.0MHz		4.6		Ω

■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =0~-10V, V <sub>DD</sub> =-20V, I <sub>D</sub> =-12.7A		36	50	nC
		V <sub>GS</sub> =0~-5V, V <sub>DD</sub> =-20V, I <sub>D</sub> =-12.7A		19	27	nC
Gate to Source Charge	Q <sub>GS</sub>	V <sub>DD</sub> =-20V, I <sub>D</sub> =-12.7A		7		nC
Gate to Drain Charge	Q <sub>GD</sub>			8		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-20V, I <sub>D</sub> =-12.7A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> =-10V		10	19	ns
Rise Time	t <sub>R</sub>			7	13	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			38	60	ns
Fall-Time	t <sub>F</sub>			15	27	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-12.7A, V <sub>GS</sub> =0V (Note 1)		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t <sub>RR</sub>	I <sub>F</sub> =-12.7A, di/dt=100A/μs		29	44	ns
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>			26	40	μC

Notes: 1. Pulse Test: Pulse Width < 300μs, Duty cycle < 2.0%.

2. Starting T<sub>J</sub> = 25°C, L = 3mH, I<sub>AS</sub> = 15A, V<sub>DD</sub> = 40V, V<sub>GS</sub> = 10V.

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