



## UTT30P04

Preliminary

Power MOSFET

### 40A, 21V P-CHANNEL POWER MOSFET

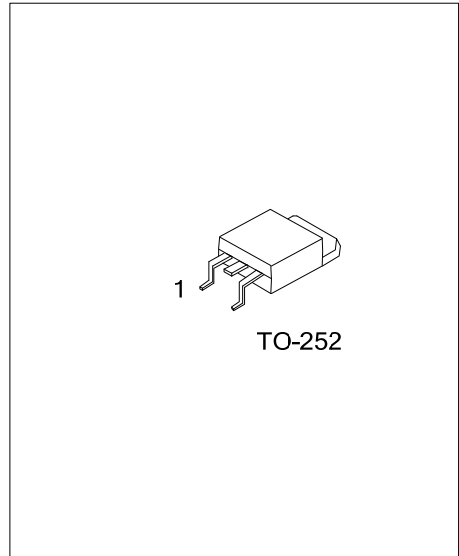
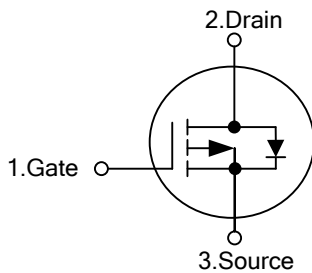
#### DESCRIPTION

The UTC **UTT30P04** is a P-channel power MOSFET providing customers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness by UTC's advanced technology.

#### FEATURES

- \* Low on-Resistance
- \* Fast Switching Speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT30P04L-TN3-R	UTT30P04G-TN3-R	TO-252	G	D	S	Tape Reel

Note: G:Gate, D:Drain, S:Source

UTT30P04G-TN3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) TN3: TO-252 (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	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	21
		$T_C=70^\circ\text{C}$	-17
Pulsed Drain Current (Note 2)	$I_{DM}$	-70	A
Avalanche Current	$I_{AS}$	-27	
Avalanche Energy (Note 3)	$E_{AS}$	36	
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	30
		$T_C=70^\circ\text{C}$	20
Junction Temperature	$T_J$	-55~150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~150	$^\circ\text{C}$

Note: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. Pulse width limited by maximum junction temperature.

3.  $V_{DD}=-20\text{V}$ . Starting  $T_J=25^\circ\text{C}$ .

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	40	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	4.1	$^\circ\text{C/W}$

■ 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>	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
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			10	
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±250	nA
On-State Drain Current (Note 1)	I <sub>D(ON)</sub>	V <sub>DS</sub> =-5V, V <sub>GS</sub> =-10V	-70			A
<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	-2.5	-3	V
Static Drain-Source On-State Resistance (Note 1)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-5V, I <sub>D</sub> =-8A		65	73	mΩ
		V <sub>GS</sub> =-7V, I <sub>D</sub> =-8A		35	50	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A		30	40	
Forward Transconductance (Note 1)	g <sub>FS</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-10A		20		S
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		4.95		Ω
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-20V, f=1.0MHz		1090		pF
Output Capacitance	C <sub>OSS</sub>			175		
Reverse Transfer Capacitance	C <sub>RSS</sub>			91		
<b>SWITCHING PARAMETERS (Note 2)</b>						
Total Gate Charge	Q <sub>G</sub> (V <sub>GS</sub> =-10V)	V <sub>DS</sub> =0.5V <sub>(BR)DSS</sub> , I <sub>D</sub> =-18A		17		nC
	Q <sub>G</sub> (V <sub>GS</sub> =-4.5V)			8.5		
Gate to Source Charge	Q <sub>GS</sub>			5.5		
Gate to Drain Charge	Q <sub>GD</sub>			3		
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-20V, I <sub>D</sub> ≈-10A, R <sub>GS</sub> =6Ω, R <sub>L</sub> =2Ω		6		ns
Rise Time	t <sub>R</sub>			16		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			26		ns
Fall-Time	t <sub>F</sub>			10		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Continuous Current	I <sub>S</sub>				-21	A
Drain-Source Diode Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> =-10A, V <sub>GS</sub> =0V			-1.2	V
Reverse Recovery Time	t <sub>RR</sub>	I <sub>F</sub> =-10A, dI <sub>F</sub> /dt=100A/μs		15.5		ns
Reverse Recovery Charge	Q <sub>RR</sub>			7.9		nC

Note: 1. Pulsed test: Pulse width ≤300μsec, duty cycle ≤2%.

2. Independent of operating temperature.

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