



## UTT25P10

Power MOSFET

### -25A, -100V P-CHANNEL POWER MOSFET

#### DESCRIPTION

The UTC **UTT25P10** 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.

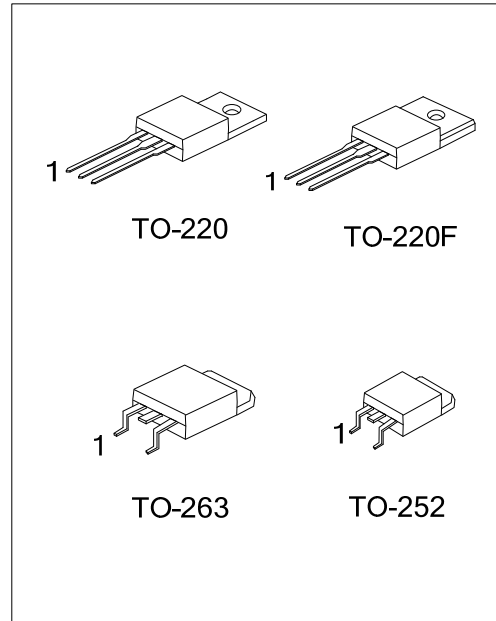
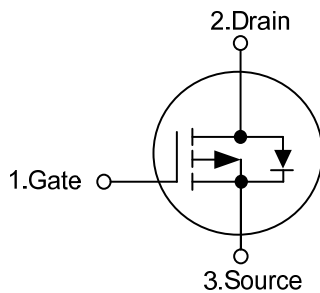
This UTC **UTT25P10** is suitable for motor drivers, switching regulators, converters and relay drivers, etc.

#### FEATURES

\*  $R_{DS(ON)} < 0.15\Omega @ V_{GS} = -10V, I_D = -25A$

\* High Switching Speed

#### SYMBOL



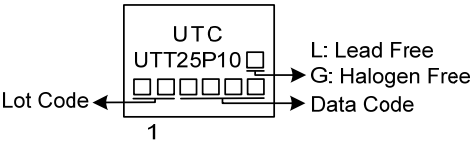
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT25P10L-TA3-T	UTT25P10G-TA3-T	TO-220	G	D	S	Tube
UTT25P10L-TF3-T	UTT25P10G-TF3-T	TO-220F	G	D	S	Tube
UTT25P10L-TN3-R	UTT25P10G-TN3-R	TO-252	G	D	S	Tape Reel
UTT25P10L-TQ2-T	UTT25P10G-TQ2-T	TO-263	G	D	S	Tube
UTT25P10L-TQ2-R	UTT25P10G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>UTT25P10L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TN3: TO-252, TQ2: TO-263</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING



### ■ ABSOLUTE MAXIMUM RATINGS ( $T_c=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)		$V_{DSS}$	-100	V
Drain-Gate Voltage ( $R_{GS}=20\text{k}\Omega$ )		$V_{DGR}$	-100	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	-25	A
	Pulsed (Note 2)	$I_{DM}$	-60	A
Single Pulsed Avalanche Energy (Note 3)		$E_{AS}$	70	mJ
Power Dissipation	TO-220/TO-263	$P_D$	100	W
	TO-220F		2	
	TO-252		50	
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. Repetitive rating: pulse width limited by maximum junction temperature.

3.  $L = 0.35\text{mH}$ ,  $I_{AS} = 20\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

### ■ THERMAL CHARACTERISTICS

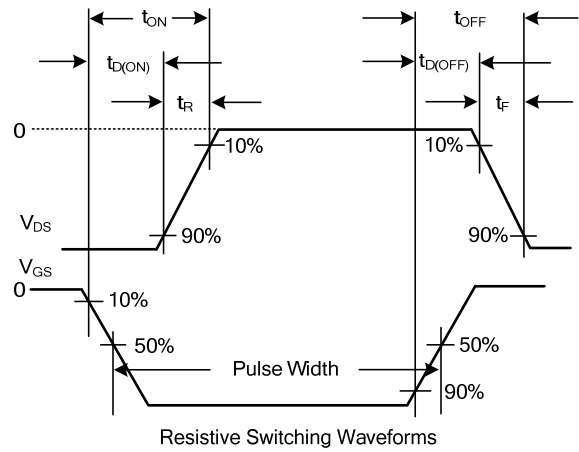
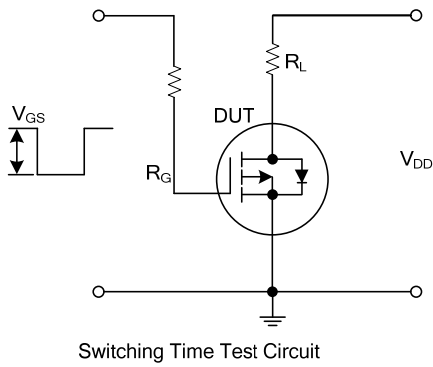
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220/TO-263	$\theta_{JC}$	0.83	$^\circ\text{C/W}$
	TO-220F		4.5	
	TO-252		2.5	

### ■ ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ , unless otherwise specified)

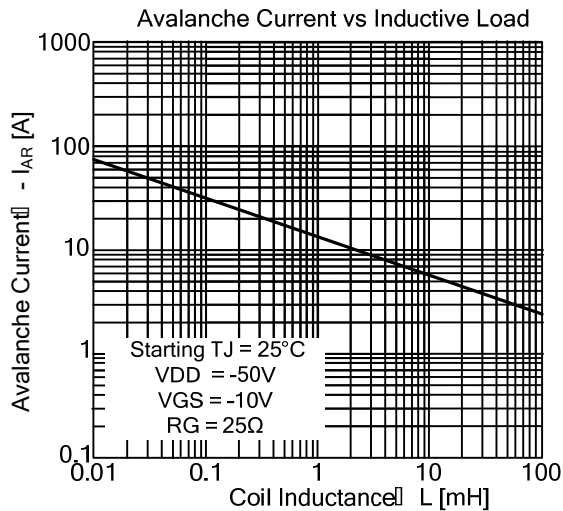
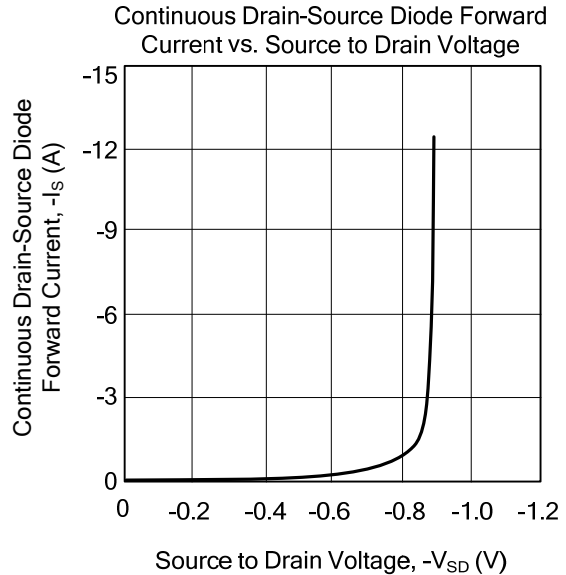
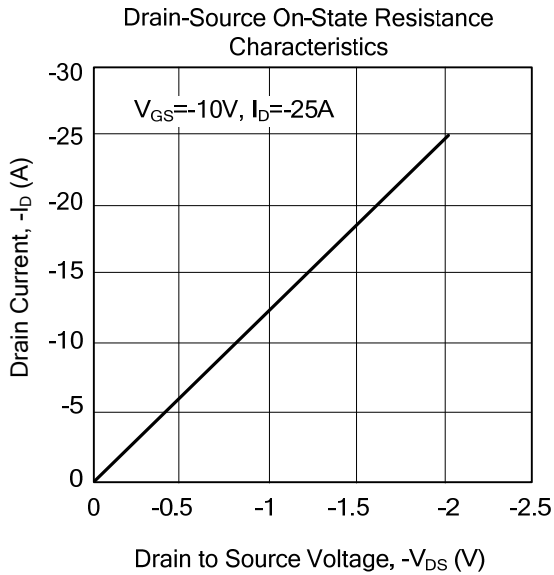
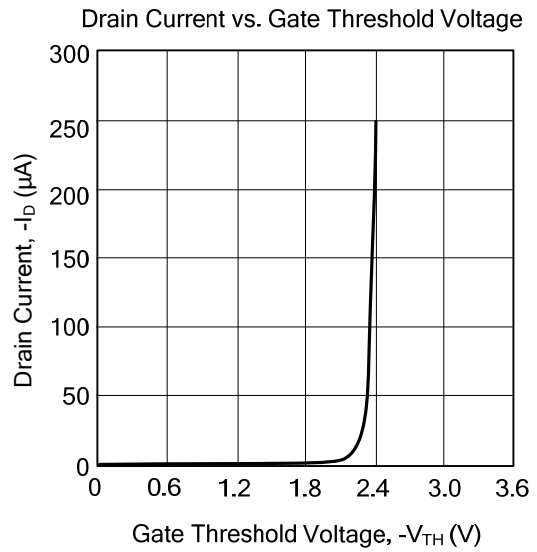
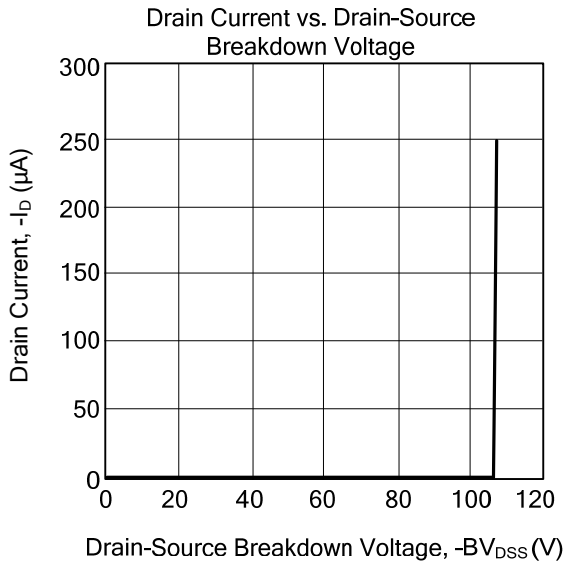
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = -250\mu\text{A}$ , $V_{GS}=0\text{V}$	-100			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=\text{Rated } BV_{DSS}$ , $V_{GS}=0\text{V}$			-1	$\mu\text{A}$
		$V_{DS}=0.8 \times \text{Rated } BV_{DSS}$ , $V_{GS}=0\text{V}$ , $T_c=125^\circ\text{C}$			-25	
Gate- Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$		+100	nA
	Reverse			$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$		
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D = -250\mu\text{A}$	-1.0		-3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$ , $I_D = -25\text{A}$			0.15	$\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=-25\text{V}$ , $f=1\text{MHz}$		430		pF
Output Capacitance	$C_{OSS}$			145		pF
Reverse Transfer Capacitance	$C_{RSS}$			110		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=-10\text{V}$ , $V_{DD}=-50\text{V}$ , $I_D=-1.3\text{A}$ , $I_G = -100\mu\text{A}$		285		nC
Gate to Source Charge	$Q_{GS}$			16		nC
Gate to Drain Charge	$Q_{GD}$			16		nC
Turn-ON Delay Time	$t_{D(ON)}$	$I_D=-0.5\text{A}$ , $V_{DS}=-30\text{V}$ , $R_G=25\Omega$ , $V_{GS}=-10\text{V}$		85		ns
Rise Time	$t_R$			60		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			780		ns
Fall-Time	$t_F$			150		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_{SD}=-12.5\text{A}$			-1.4	V

Note: Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

## ■ TEST CIRCUITS AND WAVEFORMS



## TYPICAL CHARACTERISTICS



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