



# UTT6N10Z

*Power MOSFET*

## 6A, 100V N-CHANNEL POWER MOSFET

■ DESCRIPTION

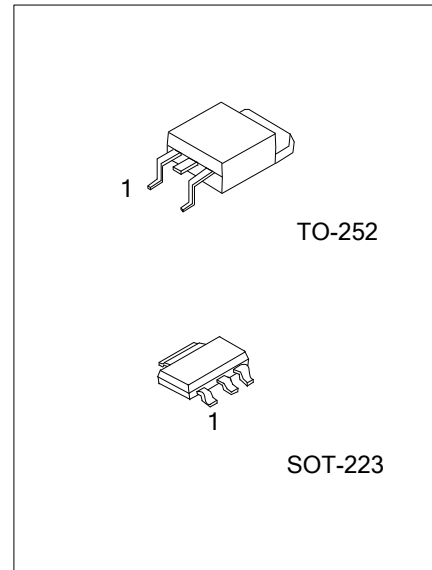
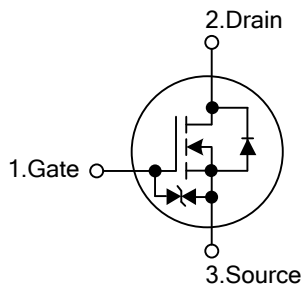
The UTC **UTT6N10Z** is a N-channel enhancement mode Power FET, it uses UTC's advanced technology to provide customers a minimum on-state resistance, high switching speed and ultra low gate charge.

The UTC **UTT6N10Z** is usually used in DC-DC Converters.

■ FEATURES

- \*  $R_{DS(on)} < 108\text{ m}\Omega$  @  $V_{GS} = 10\text{V}$ ,  $I_D = 3.0\text{A}$
- \* High Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT6N10ZL-AA3-R	UTT6N10ZG-AA3-R	SOT-223	G	D	S	Tape Reel
UTT6N10ZL-TN3-R	UTT6N10ZG-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT6N10ZG-AA3-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AA3: SOT-223, TN3: TO-252</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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■ MARKING

SOT-223	TO-252

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	6	A
	Pulsed	$I_{DM}$	24	A
Single Pulsed Avalanche Energy (Note 3)		$E_{AS}$	12	mJ
Peak Diode Recovery $dv/dt$ (Note 5)		$dv/dt$	4.2	V/ns
Power Dissipation	$T_C=25^{\circ}\text{C}$ SOT-223	$P_D$	8	W
	$T_A=25^{\circ}\text{C}$ TO-252		1.25	W
Junction Temperature		$T_J$	150	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

Note: 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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 1)	SOT-223	$\theta_{JA}$	150	$^{\circ}\text{C/W}$
	TO-252		100	$^{\circ}\text{C/W}$
Junction to Case	SOT-223	$\theta_{JC}$	12	$^{\circ}\text{C/W}$
	TO-252		7.5	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , 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	$I_{DSS}$	$V_{DS}=80\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	Forward	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$			+10	$\mu\text{A}$
	Reverse	$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$			-10	$\mu\text{A}$
<b>ON CHARACTERISTICS (Note 2)</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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=3.0\text{A}$		90	108	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=1.0\text{A}$		95	153	$\text{m}\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		720	900	$\text{pF}$
Output Capacitance	$C_{OSS}$			85	65	$\text{pF}$
Reverse Transfer Capacitance	$C_{RSS}$			33	60	$\text{pF}$
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}$ , $V_{DD}=50\text{V}$ , $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$		28		$\text{nC}$
Gate to Source Charge	$Q_{GS}$			3.9		$\text{nC}$
Gate to Drain Charge	$Q_{GD}$			5.3		$\text{nC}$
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$ , $I_D=0.5\text{A}$ , $V_{GS}=10\text{V}$ , $R_{GEN}=25\Omega$		30		$\text{ns}$
Rise Time	$t_R$			50		$\text{ns}$
Turn-OFF Delay Time	$t_{D(OFF)}$			280		$\text{ns}$
Fall-Time	$t_F$			80		$\text{ns}$
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				6	A
Source Current Pulsed	$I_{SM}$				24	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=6\text{A}$ , $V_{GS}=0\text{V}$ (Note 2)		0.8	1.3	V
Reverse Recovery Time	$t_{rr}$	$I_S=6\text{A}$ , $V_{GS}=0\text{V}$ ,		70		$\text{ns}$
Reverse Recovery Charge	$Q_{rr}$	$di_F/dt=100\text{A}/\mu\text{s}$ (Note 1)		115		$\text{nC}$

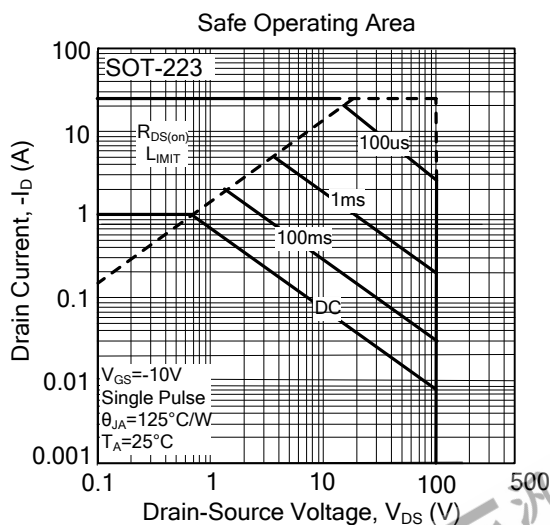
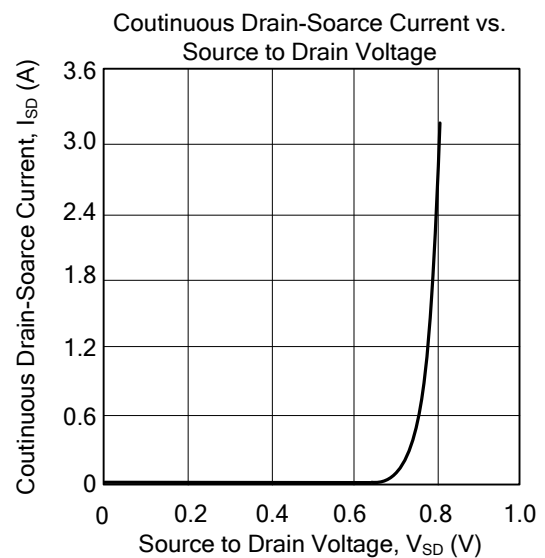
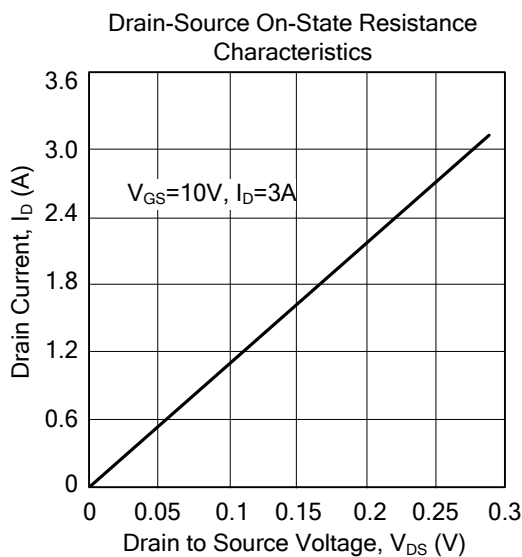
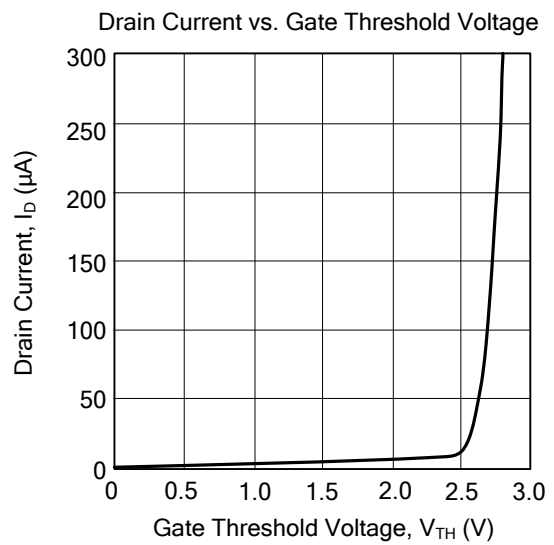
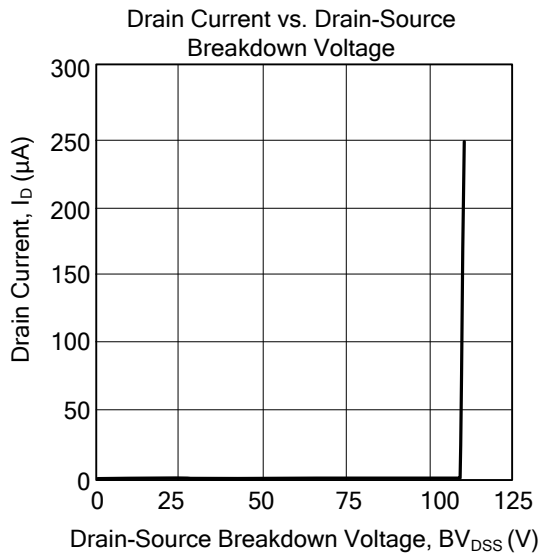
Notes: 1.  $\theta_{JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

$\theta_{JC}$  is guaranteed by design while  $\theta_{JA}$  is determined by the user's board design.

2. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

3. Starting  $T_J = 25^\circ\text{C}$ ,  $L = 11\text{mH}$ ,  $I_{AS} = 6\text{A}$ ,  $V_{DD} = 90\text{V}$ ,  $V_{GS} = 10\text{V}$ .

### TYPICAL CHARACTERISTICS



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