



# UT3N10

*Power MOSFET*

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

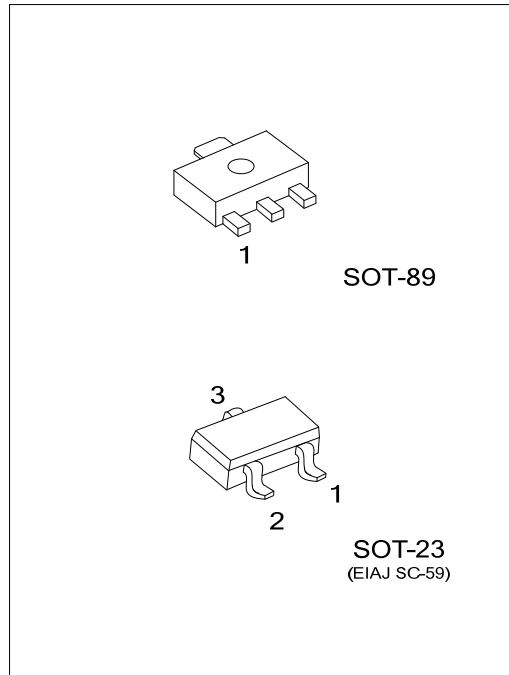
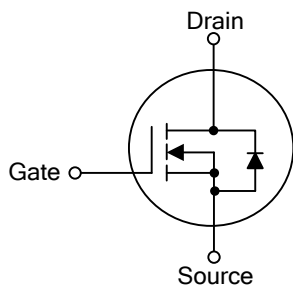
### DESCRIPTION

The UTC **UT3N10** is an N-channel power MOSFET providing very low on-resistance. It has high efficiency and perfect cost-effectiveness. It can be generally applied in the commercial and industrial fields.

### FEATURES

- \*  $R_{DS(ON)} < 0.165\Omega$  @  $V_{GS}=10V, I_D=3A$
- $R_{DS(ON)} < 0.180\Omega$  @  $V_{GS}=4.5V, I_D=2A$
- \* Simple drive requirement

### SYMBOL



### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UT3N10G-AB3-R	SOT-89	G	D	S	Tape Reel
UT3N10G-AE3-R	SOT-23	S	G	D	Tape Reel

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

<p>UT3N10G-AB3-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) AB3: SOT-89, AE3: SOT-23</li> <li>(3) G: Halogen Free and Lead Free</li> </ul>
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### MARKING

SOT-89	SOT-23

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	100	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS}=4.5V$ , $T_A=25^\circ C$ ) (Note 2)	$I_D$	3.0	A
Pulsed Drain Current (Note 3, 4)	$I_{DM}$	10	A
Power Dissipation ( $T_A=25^\circ C$ )	SOT-89	0.55	W
	SOT-23	0.35	W
Junction Temperature	$T_J$	+150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ C$

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. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270 $^\circ C/W$  when mounted on min. copper pad.
3. Pulse width limited by  $T_{J(MAX)}$
4. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

### ■ THERMAL DATA

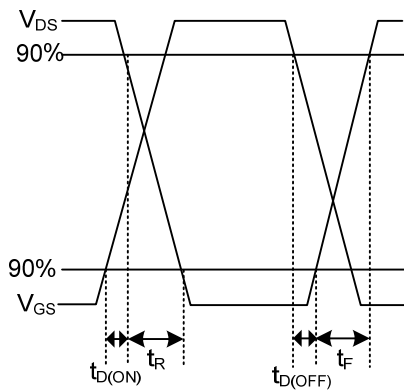
PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	SOT-89	180	$^\circ C/W$
	SOT-23	350	$^\circ C/W$

### ■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ C$ , unless otherwise specified)

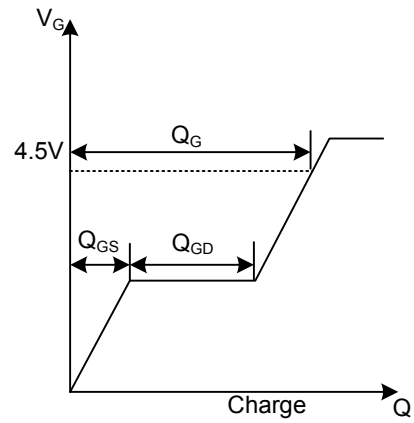
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$ , $I_D=250\mu A$	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to $25^\circ C$ , $I_D=1mA$		0.05		$V/^\circ C$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=100V$ , $V_{GS}=0V$			10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu A$	1.0		3.0	V
Drain to Source On-state Resistance	$R_{DS(ON)}$	$V_{GS}=10V$ , $I_D=3A$			0.165	$\Omega$
		$V_{GS}=4.5V$ , $I_D=2A$			0.180	$\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V$ , $V_{GS}=0V$ , $f=1.0MHz$		490	780	pF
Output Capacitance	$C_{OSS}$			41		pF
Reverse Transfer Capacitance	$C_{RSS}$			33		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note)	$Q_G$	$V_{GS}=4.5V$ , $V_{DS}=48V$ , $I_D=3A$		18		nC
Gate Source Charge	$Q_{GS}$			3.76		nC
Gate Drain Charge	$Q_{GD}$			8.5		nC
Turn-ON Delay Time (Note)	$t_{D(ON)}$	$V_{GS}=10V$ , $V_{DS}=30V$ , $I_D=1A$ , $R_D=30\Omega$ , $R_G=3.3\Omega$		22		ns
Turn-ON Rise Time	$t_R$			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			190		ns
Turn-OFF Fall-Time	$t_F$			65		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note)	$V_{SD}$	$I_S=1.2A$ , $V_{GS}=0V$			1.2	V
Reverse Recovery Time	$t_{rr}$	$I_S=3A$ , $V_{GS}=0V$ , $dI/dt=100A/\mu s$		25		ns
Reverse Recovery Charge	$Q_{rr}$				26	

Note: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

## ■ TEST WAVEFORMS

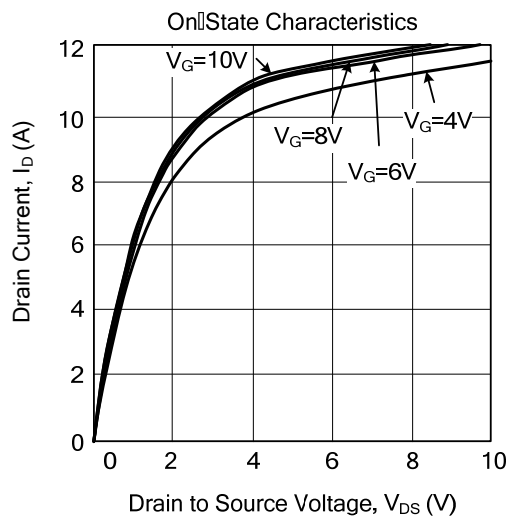
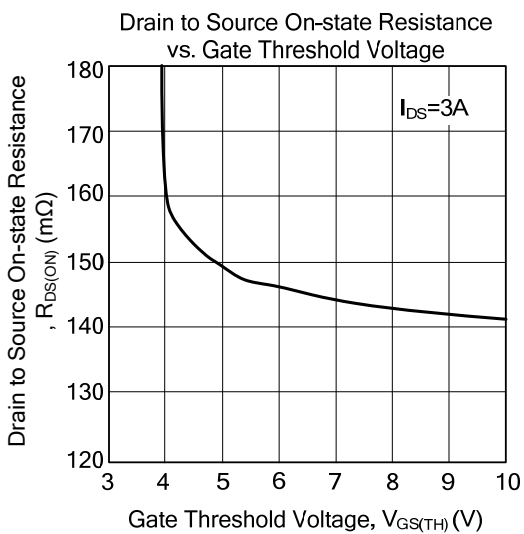
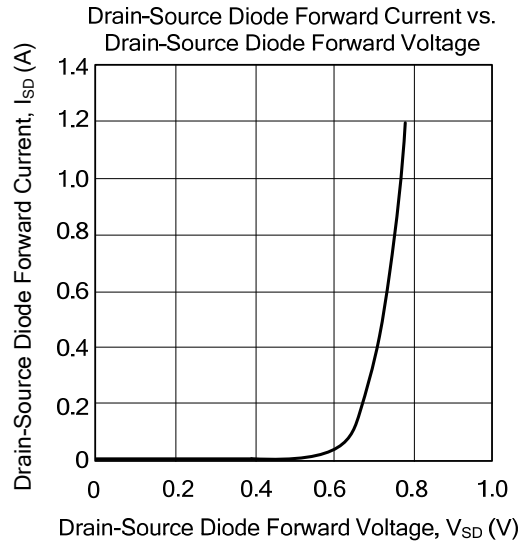
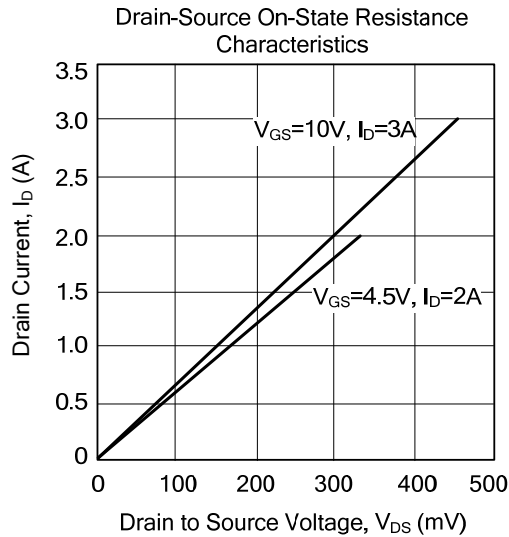
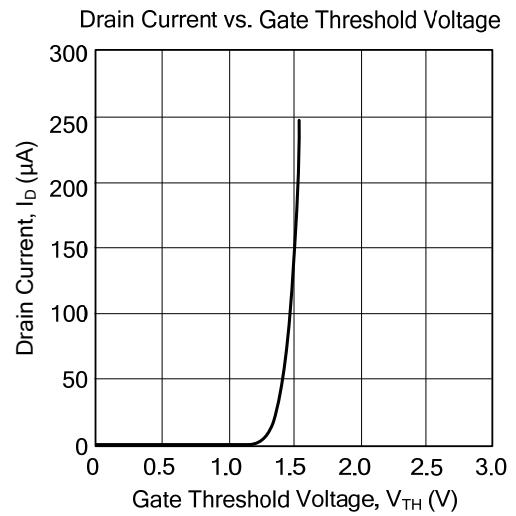
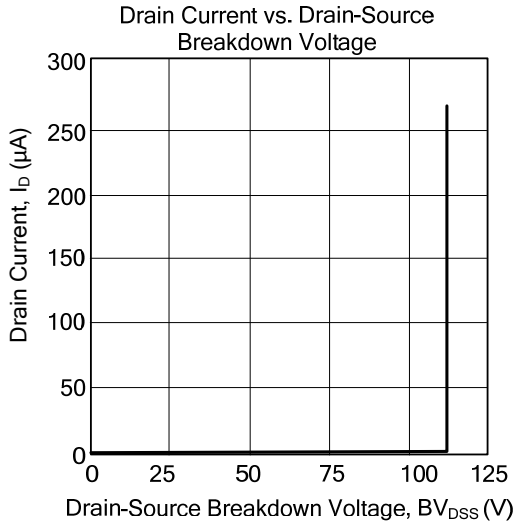


Switching Time Waveform

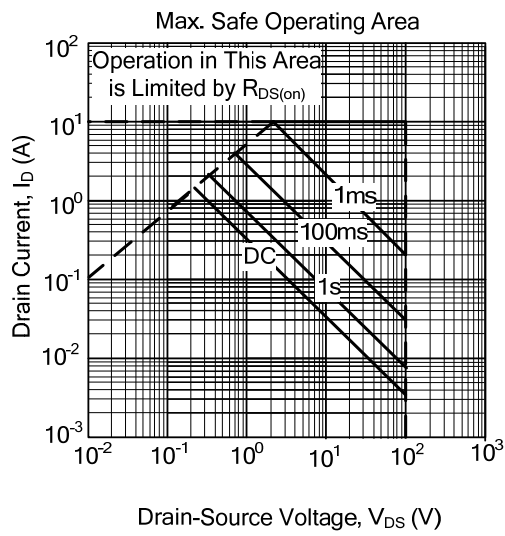


Gate Charge Waveform

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



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