



# UT3404

*Power MOSFET*

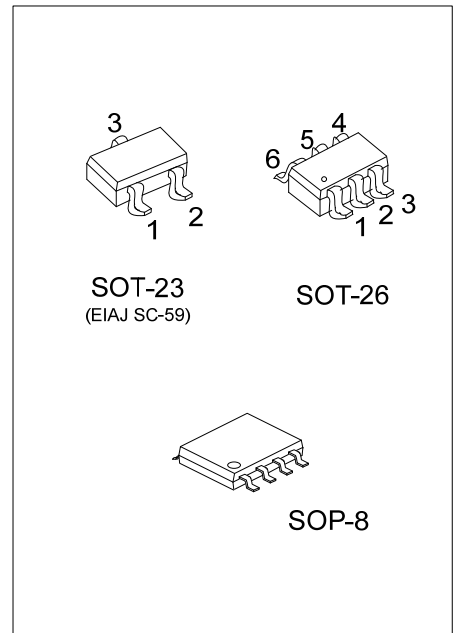
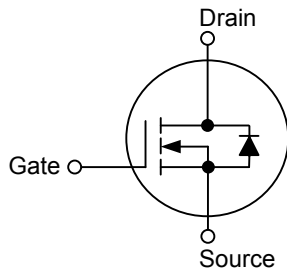
## N-CHANNEL ENHANCEMENT MODE MOSFET

■ DESCRIPTION

The **UT3404** is N-Channel enhancement mode power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities and operation with low gate voltages.

This device is suitable for use as a load switch or in PWM applications.

■ SYMBOL



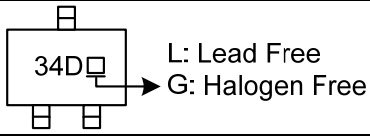
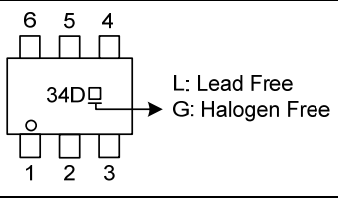
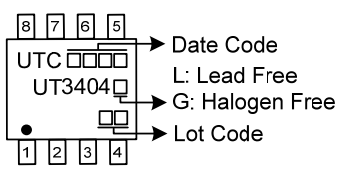
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3404L-AE2-R	UT3404G-AE2-R	SOT-23-3	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AE3-R	UT3404G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT3404L-AG6-R	UT3404G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT3404L-S08-R	UT3404G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT3404G-AE2-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23, AG6: SOT-26 S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	--

■ MARKING

PACKAGE	MARKING
<p>SOT-23-3 SOT-23</p>	 <p>34D □ → L: Lead Free G: Halogen Free</p>
<p>SOT-26</p>	 <p>34D □ → L: Lead Free G: Halogen Free</p>
<p>SOP-8</p>	 <p>UTC □ □ □ □ → Date Code L: Lead Free UT3404 □ → G: Halogen Free □ □ → Lot Code</p>

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 3)	$I_D$	5.8	A
Pulsed Drain Current (Note 1, 2)	$I_{DM}$	20	A
Power Dissipation	SOT-23-3/SOT-23	1.4	W
	SOT-26	1.6	W
	SOP-8	2	W
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Strong Temperature	$T_{STG}$	-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 DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	SOT-23-3/SOT-23	85	$^{\circ}\text{C/W}$
	SOT-26	115	$^{\circ}\text{C/W}$
	SOP-8	62.5	$^{\circ}\text{C/W}$

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

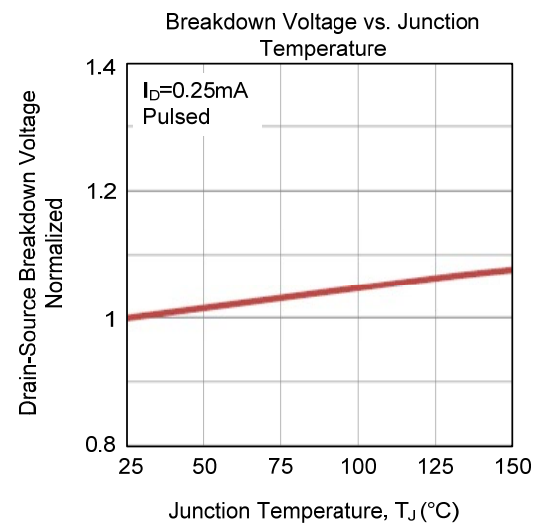
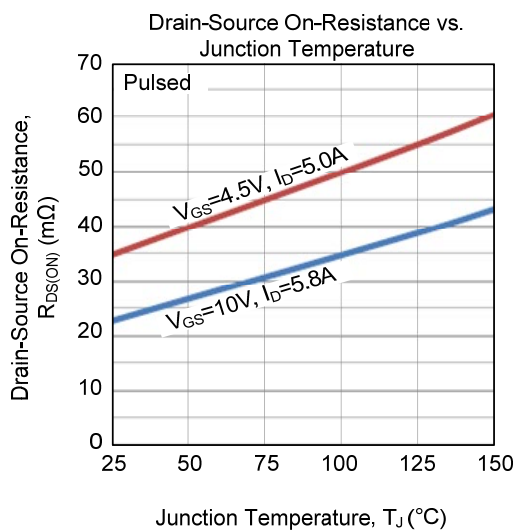
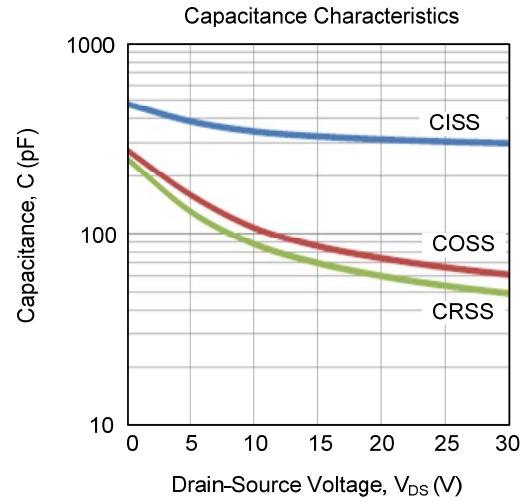
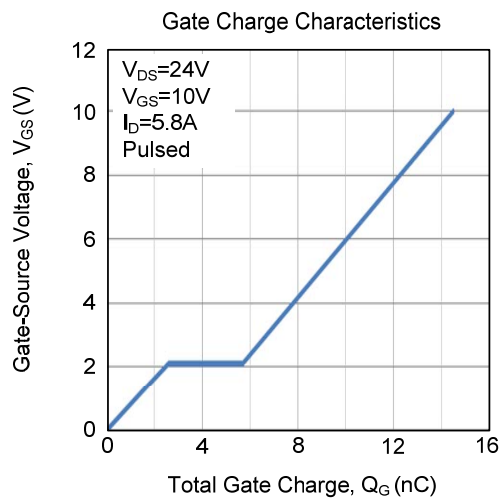
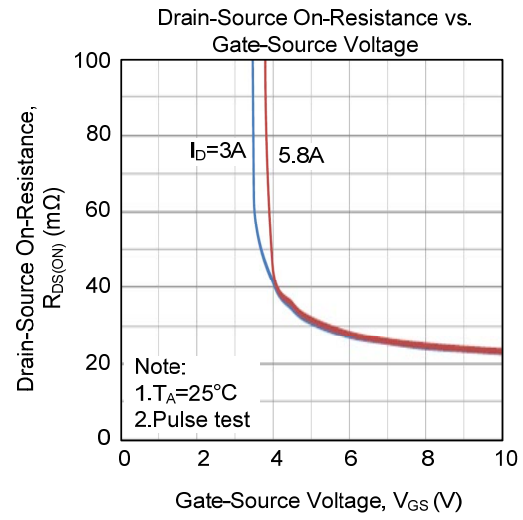
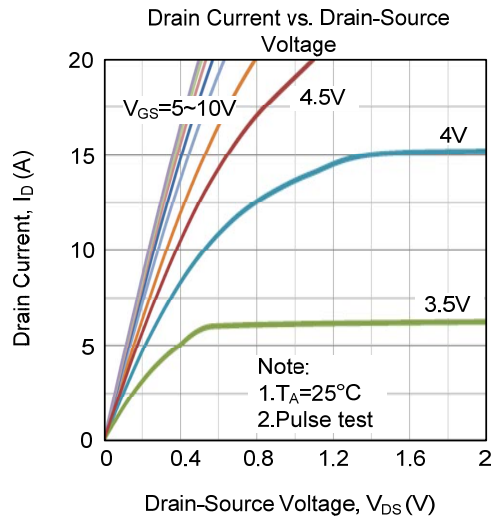
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
<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
Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=5.8\text{A}$			28	m $\Omega$
		$V_{GS}=4.5\text{V}, I_D=5.0\text{A}$			48	m $\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1.0\text{MHz}$		310		pF
Output Capacitance	$C_{OSS}$			85		pF
Reverse Transfer Capacitance	$C_{RSS}$			70		pF
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge (Note 2)	$Q_G$	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=5.8\text{A}$		14.5		nC
Gate-Source Charge	$Q_{GS}$			2.7		nC
Gate-Drain Charge	$Q_{GD}$			3.1		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, R_G=3.0\Omega, R_D=2.7\Omega$		5		ns
Turn-ON Rise Time	$t_R$			14		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			13		ns
Turn-OFF Fall Time	$t_F$			21		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				5.8	A
Drain-Source Diode Forward Voltage(Note2)	$V_{SD}$	$I_S=1.0\text{A}$			1.0	V
Reverse Recovery Time	$t_{rr}$	$I_F=5.8\text{A}, dI/dt=100\text{A}/\mu\text{s}$		200		ns
Reverse Recovery Charge	$Q_{rr}$				1.6	

Notes: 1. Repetitive Rating : Pulse width limited by maximum junction temperature.

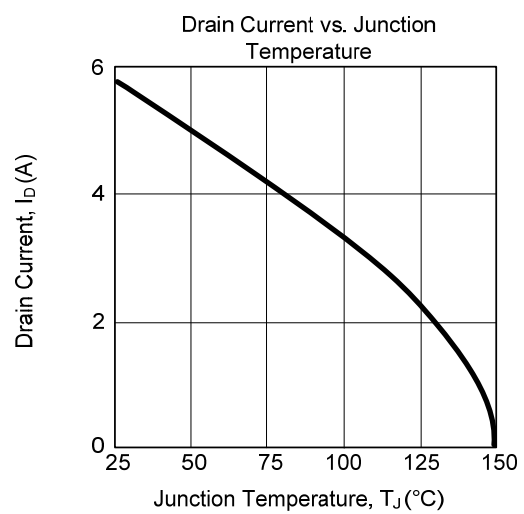
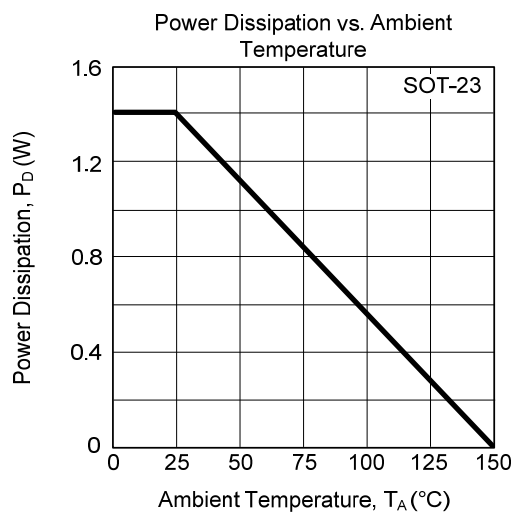
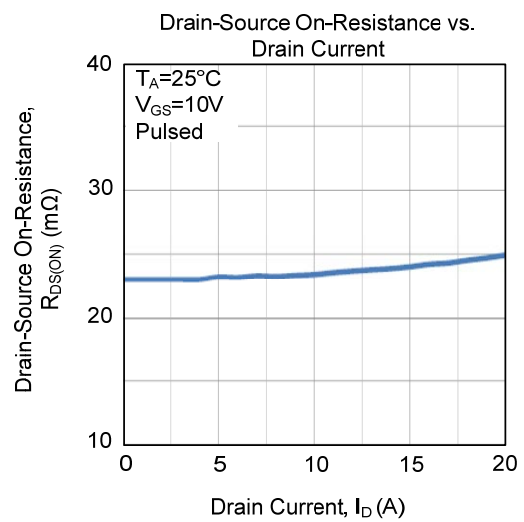
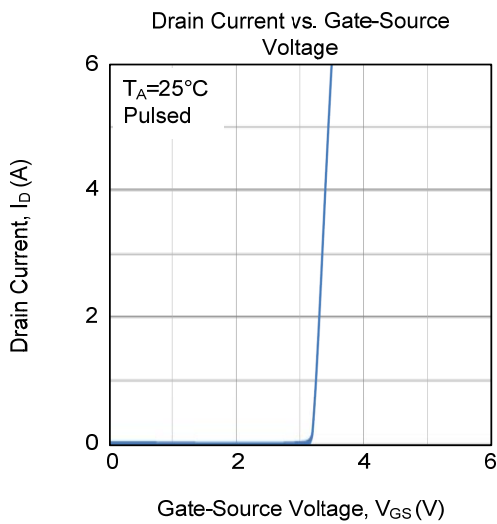
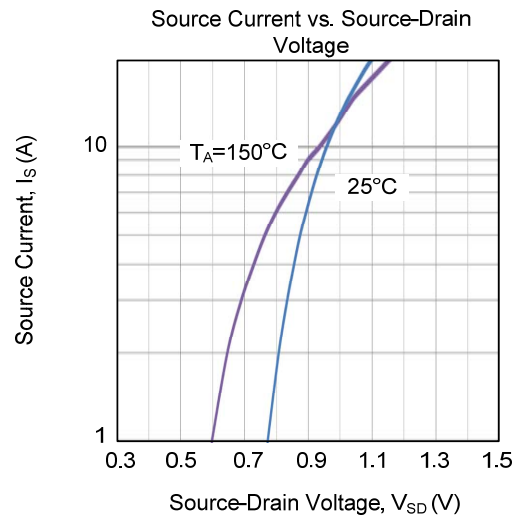
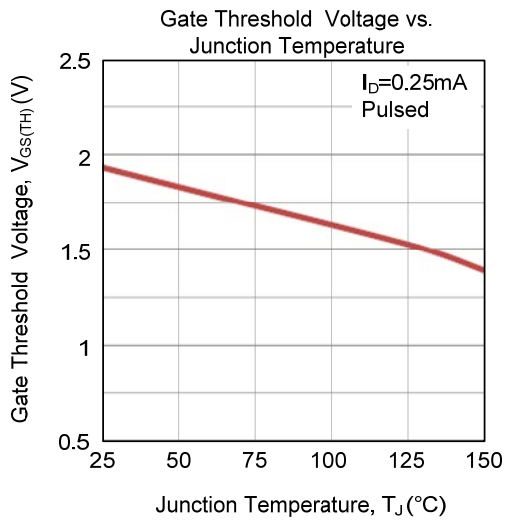
2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

3. The value of  $R_{\theta_{JA}}$  is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any a given application depends on the user's specific board design. The current rating is based on the  $t \leq 10\text{s}$  thermal resistance rating.

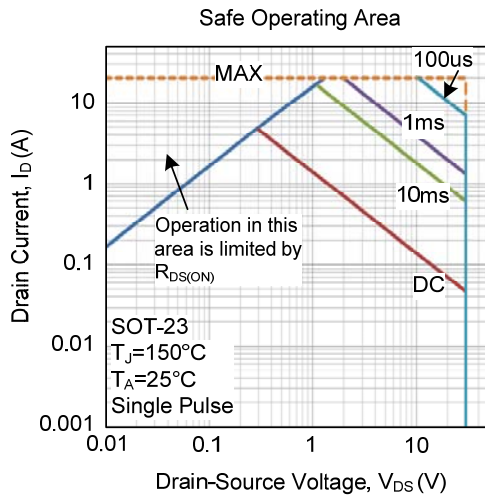
## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



Note: These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The SOA curve provides a single pulse rating.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.