



# UT6402

**Power MOSFET**

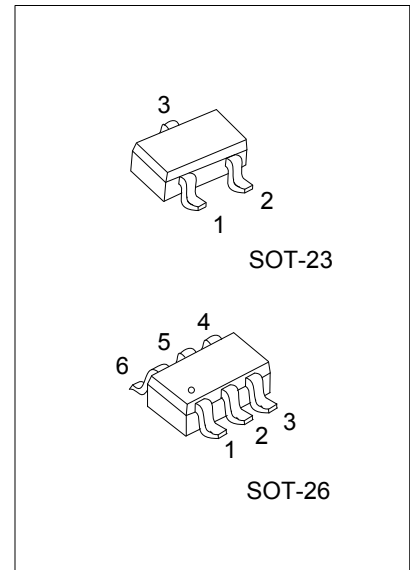
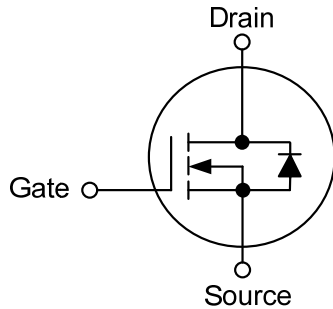
## N-CHANNEL ENHANCEMENT MODE

### DESCRIPTION

The **UT6402** is N-Channel enhancement mode Power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities, 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	
UT6402L-AE3-R	UT6402G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT6402L-AG6-R	UT6402G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

<p>UT6402G-AE3-R</p>	<p>(1) R: Tape Reel (2) AE3: SOT-23, AG6: SOT-26 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING

SOT-23	SOT-26
<p>L: Lead Free G: Halogen Free</p>	<p>L: Lead Free G: Halogen Free</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)	$I_D$	6.9	A
Pulsed Drain Current (Note 2)	$I_{DM}$	20	A
Power Dissipation	$P_D$	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 CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 3)	$\theta_{JA}$		74	110	$^\circ\text{C/W}$

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

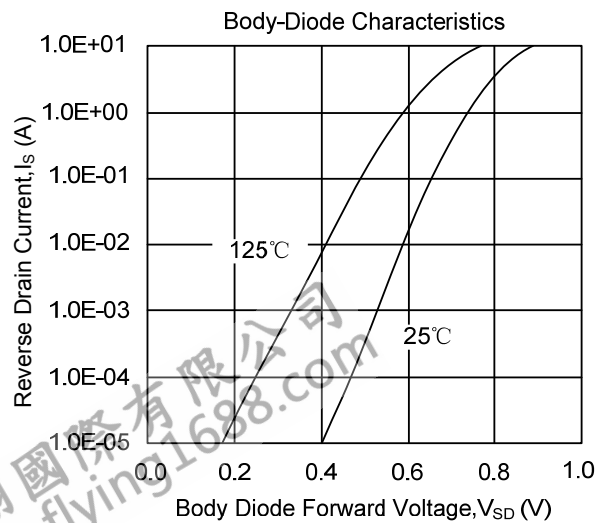
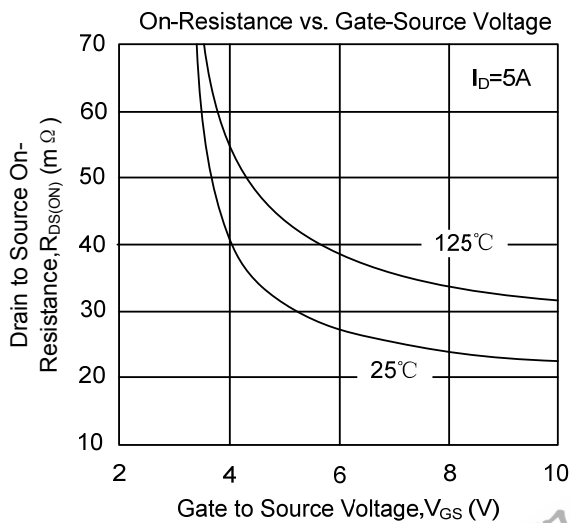
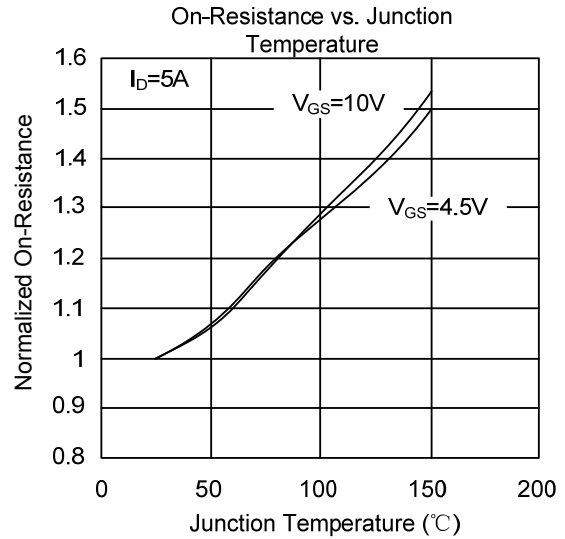
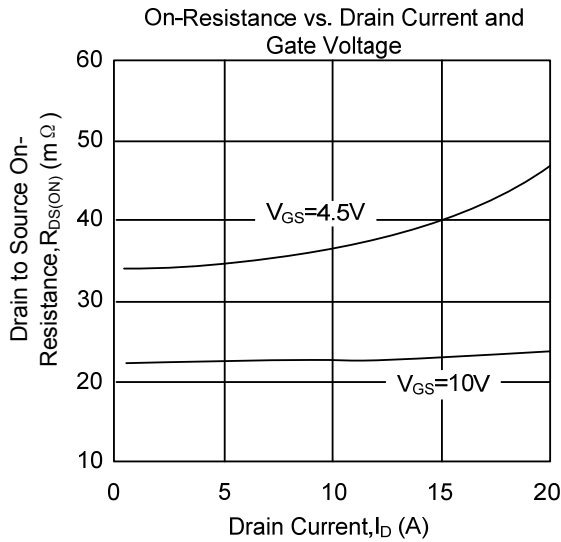
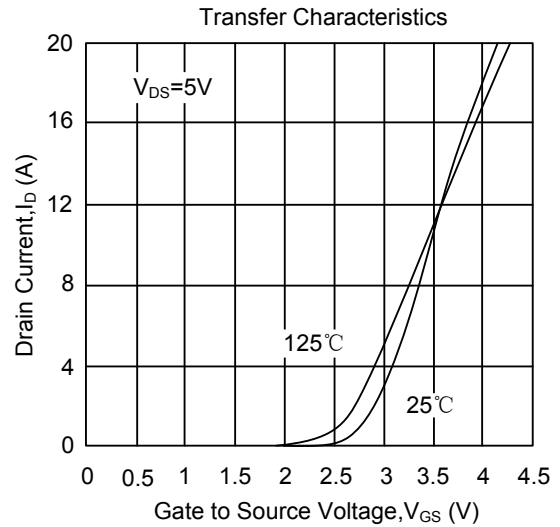
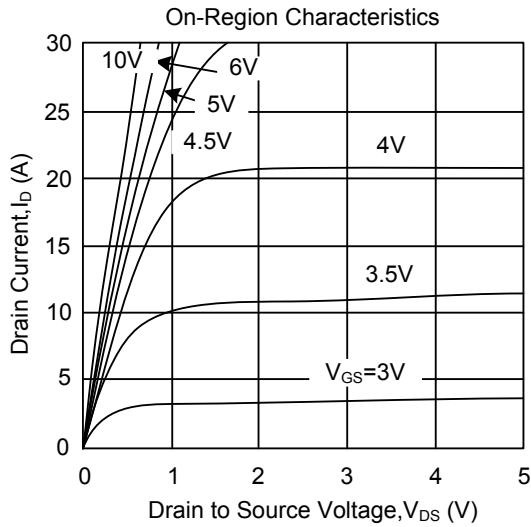
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.9	3	V
On State Drain Current	$I_{D(ON)}$	$V_{DS} = 5\text{V}, V_{GS} = 4.5\text{V}$	20			A
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 6.9\text{A}$		22.5	28	m $\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 5.0\text{A}$		34.5	42	m $\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		680	820	pF
Output Capacitance	$C_{OSS}$			102		
Reverse Transfer Capacitance	$C_{RSS}$			77	108	
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge (Note 2)	$Q_G$	$V_{DS} = 15\text{V}, V_{GS} = 10\text{V}, I_D = 6.9\text{A}$	11.5	13.88	16.7	nC
Gate Source Charge	$Q_{GS}$			1.82		
Gate Drain Charge	$Q_{GD}$			3.2		
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, R_L = 2.2\Omega, R_G = 3\Omega$		4.6		ns
Turn-ON Rise Time	$t_R$			4.1		
Turn-OFF Delay Time	$t_{D(OFF)}$			20.6		
Turn-OFF Fall-Time	$t_F$			5.2		
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				3	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S = 1\text{A}$		0.76	1	V
Reverse Recovery Time	$t_{rr}$	$I_F = 6.9\text{ A}, dI/dt = 100\text{A}/\mu\text{s}$		16.5	20	ns
Reverse Recovery Charge	$Q_{rr}$	$I_F = 6.9\text{ A}, dI/dt = 100\text{A}/\mu\text{s}$		7.8		nC

Notes: 1. Pulse width limited by  $T_{J(MAX)}$

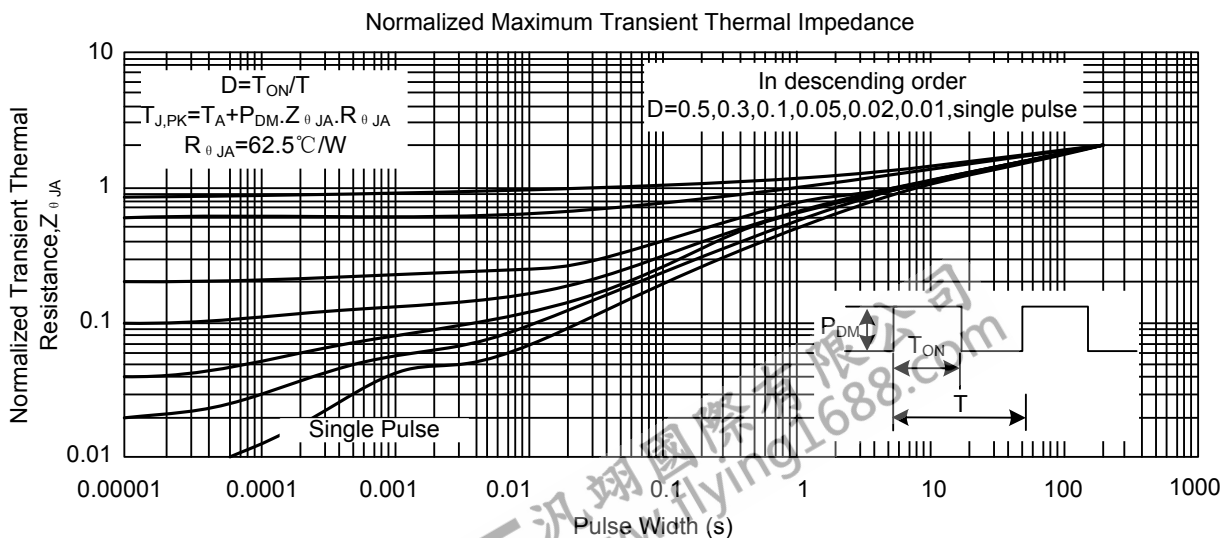
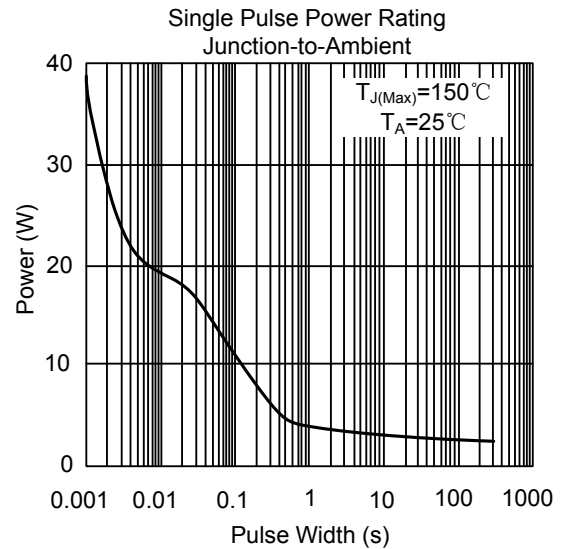
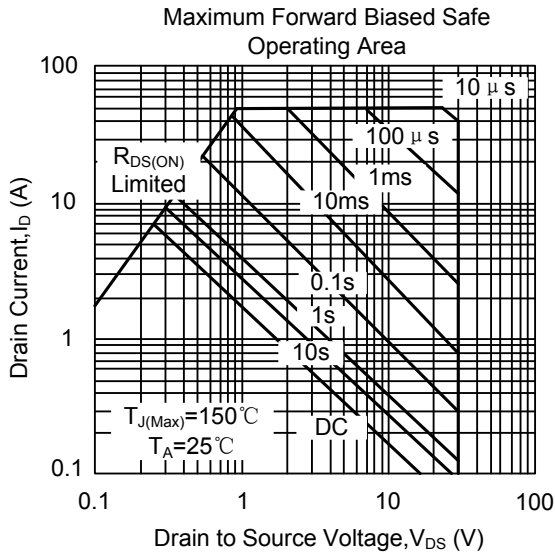
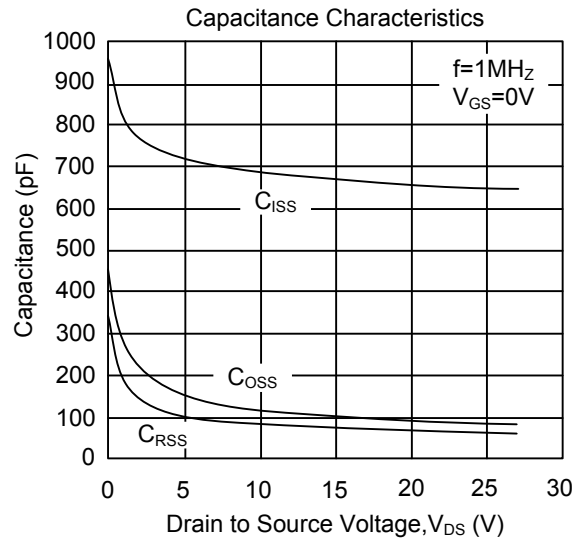
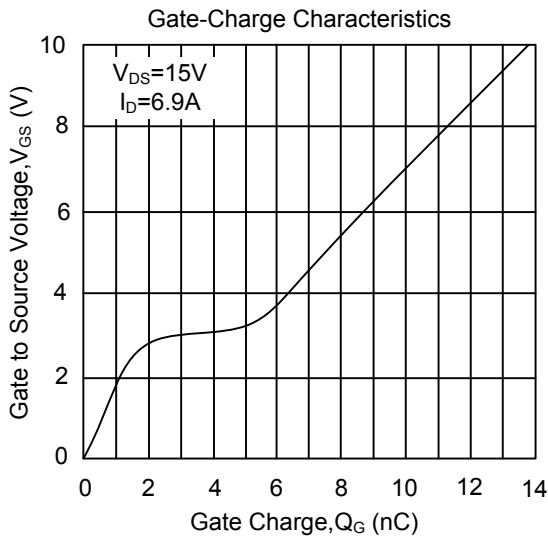
2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 0.5\%$ .

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board.

## TYPICAL CHARACTERISTICS



### TYPICAL CHARACTERISTICS (Cont.)



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