



# UT6401

**Power MOSFET**

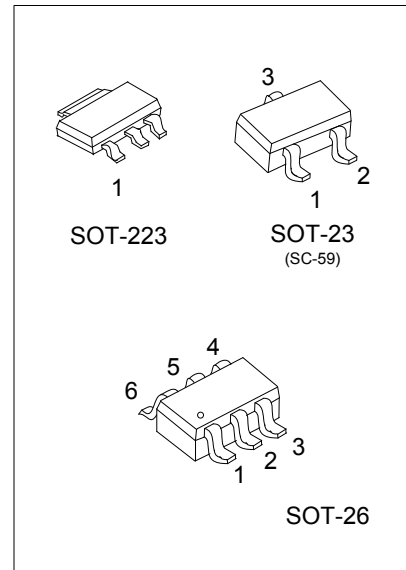
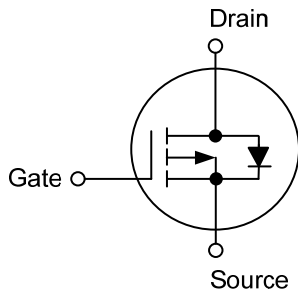
## 5A, 30V P-CHANNEL ENHANCEMENT MODE

■ DESCRIPTION

The UTC **UT6401** is P-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 charge.

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	
UT6401L-AA3-R	UT6401G-AA3-R	SOT-223	G	D	S	-	-	-	Tape Reel
UT6401L-AE3-R	UT6401G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT6401L-AG6-R	UT6401G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

<p>UT6401G-AA3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AA3: SOT-223, AG6: SOT-26, AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

SOT-223	SOT-23	SOT-26
<p>L: Lead Free G: Halogen Free Date Code</p>	<p>L: Lead Free G: Halogen Free</p>	<p>L: Lead Free G: Halogen Free</p>

■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	-30	V
Gate-Source Voltage		V <sub>GSS</sub>	±12	
Continuous Drain Current (Note 3)		I <sub>D</sub>	-5	A
Pulsed Drain Current (Note 2)		I <sub>DM</sub>	-20	
Power Dissipation	SOT-223	P <sub>D</sub>	1	W
	SOT-23		1.2	
	SOT-26			
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°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	SOT-223	θ <sub>JA</sub>	125	°C/W
	SOT-23		104	
	SOT-26			

Note: The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

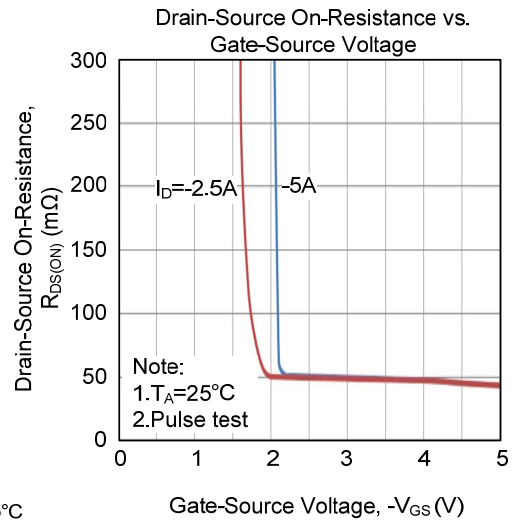
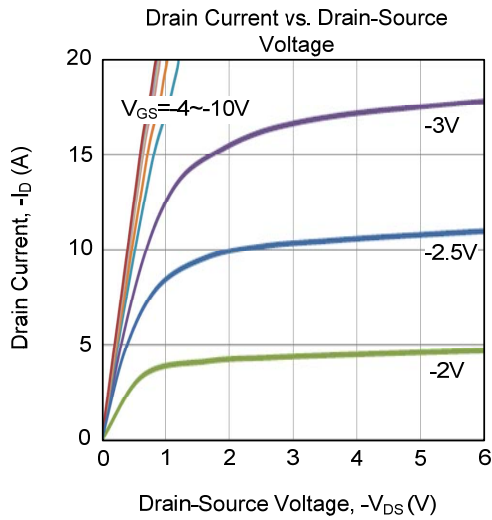
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.7	-1.0	-1.3	V
On State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =-5V, V <sub>GS</sub> =-4.5V	-25			A
Static Drain-Source On-Resistance (Note 2)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A		39	46	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A		47	57	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A		66	97	mΩ
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1.0MHz		837		pF
Output Capacitance	C <sub>OSS</sub>			120		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			105		pF
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge (Note 2)	Q <sub>G</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V,		12		nC
Gate-Source Charge	Q <sub>GS</sub>	I <sub>D</sub> =-5.0A, I <sub>G</sub> =1.0mA		2		nC
Gate-Drain Charge	Q <sub>GD</sub>	(Note 1, 2)		3.5		nC
Turn-ON Delay Time (Note 2)	t <sub>D(ON)</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-5.0A, R <sub>G</sub> =3.0Ω (Note 1, 2)		4		ns
Turn-ON Rise Time	t <sub>R</sub>			17		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			30		ns
Turn-OFF Fall Time	t <sub>F</sub>			20		ns
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				-5	A
MAXIMUM Body-Diode Pulsed Current	I <sub>SM</sub>				-20	A
Drain-Source Diode Forward Voltage(Note2)	V <sub>SD</sub>	I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V		-0.75	-1	V

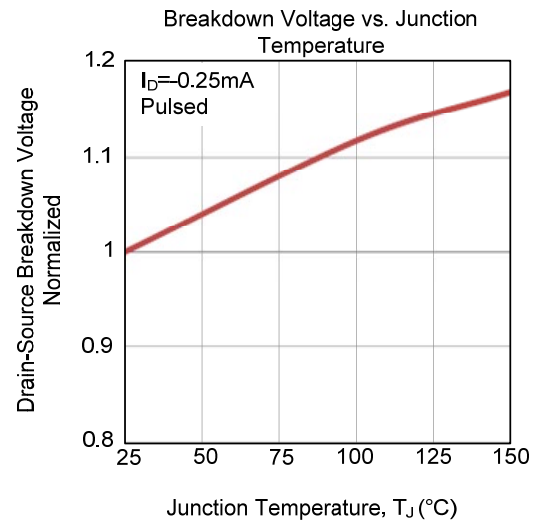
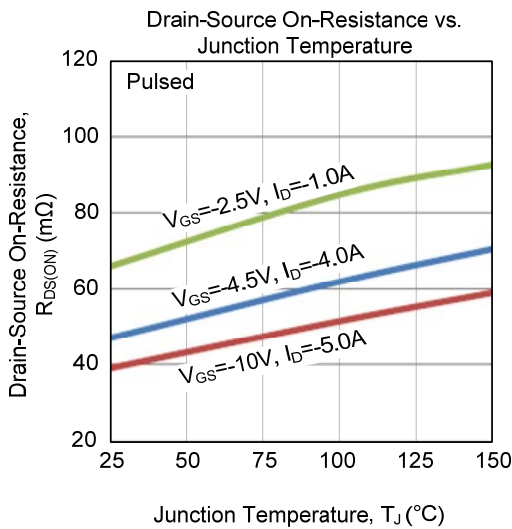
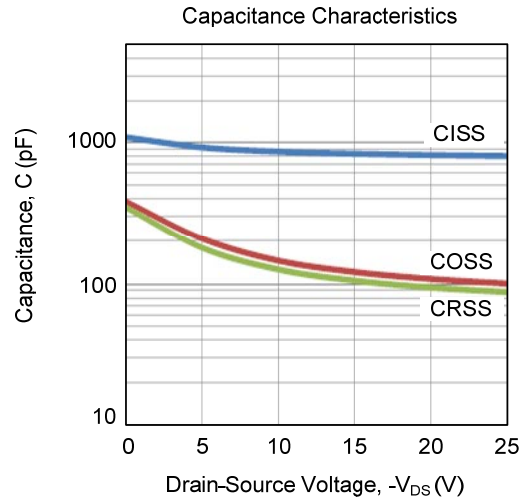
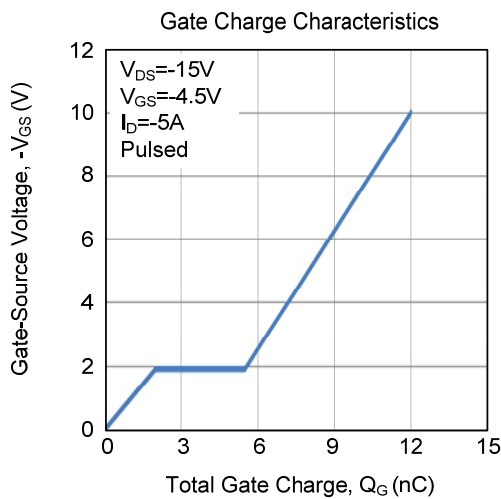
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse width ≤300μs , duty cycle ≤0.5%.

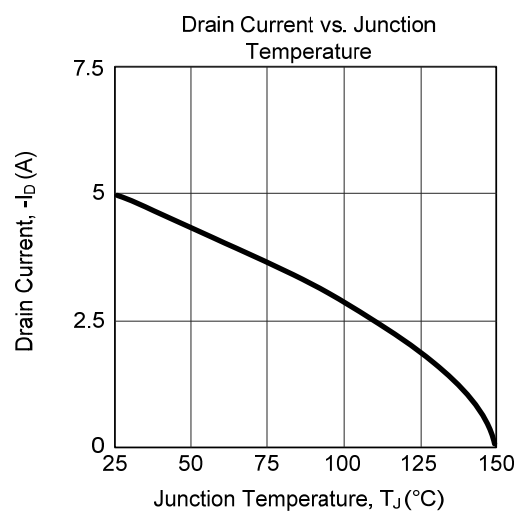
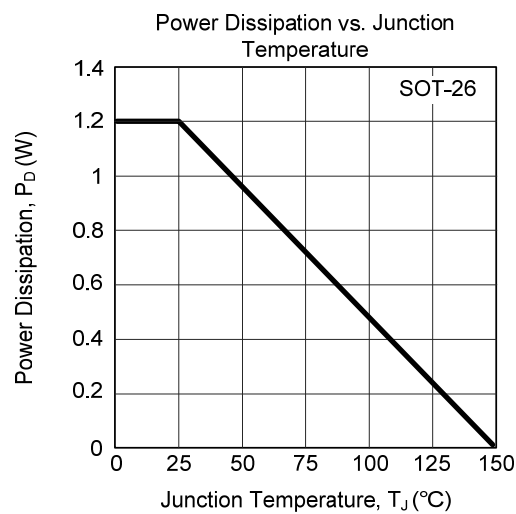
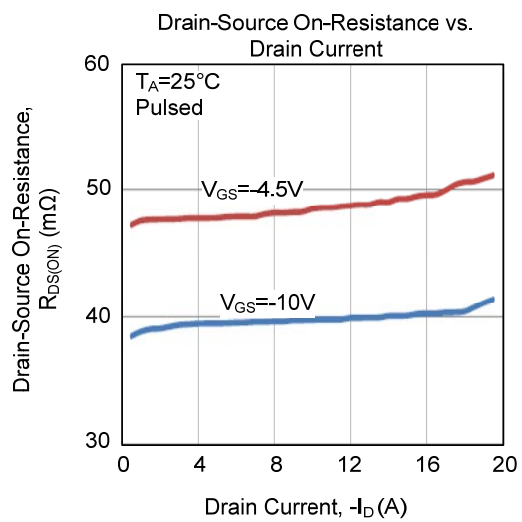
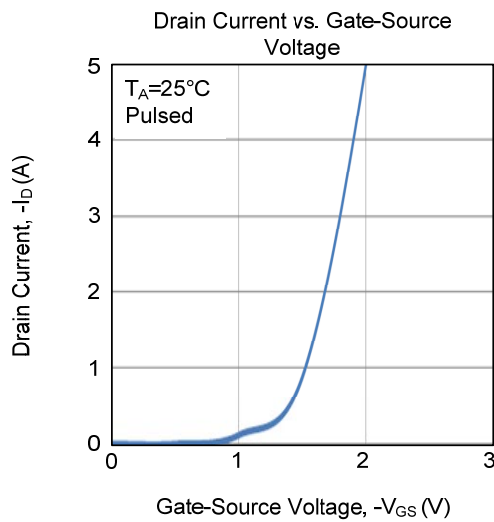
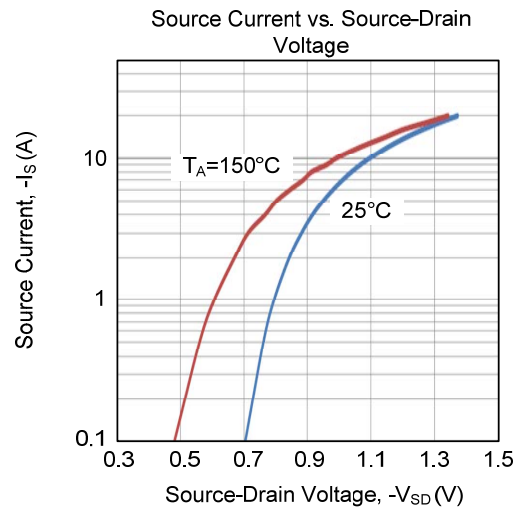
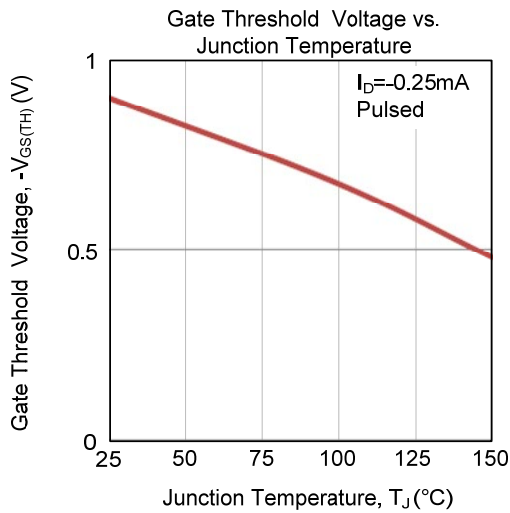
## TYPICAL CHARACTERISTICS



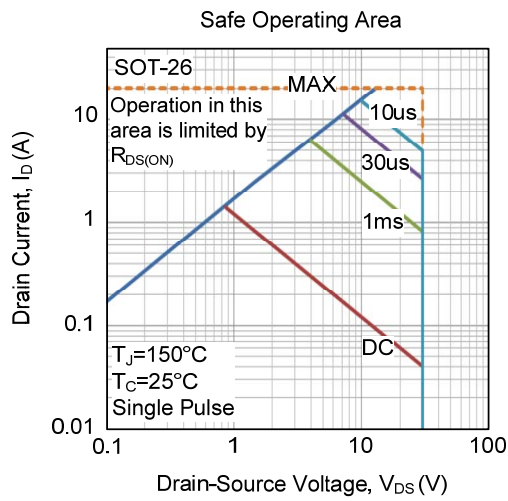
Note:  
1.  $T_A = 25^\circ C$   
2. Pulse test



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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