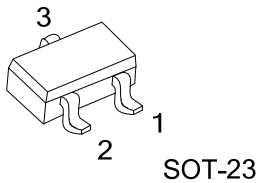
UT3401

Power MOSFET

P-CHANNEL ENHANCEMENT MODE



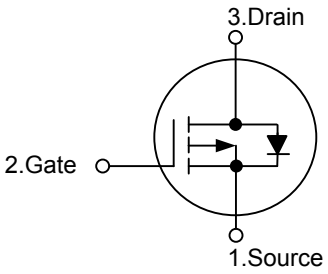
SOT-23
(EIAJ SC-59)

■ DESCRIPTION

The UTC **UT3401** is P-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



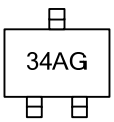
■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UT3401G-AE3-R	SOT-23	S	G	D	Tape Reel

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

UT3401G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free and Lead Free

■ MARKING



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■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current (Note 1)	I_D	-4.2	A
Pulsed Drain Current (Note 2)	I_{DM}	-30	A
Power Dissipation (Note 1)	P_D	1.4	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-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	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		65	90	°C/W

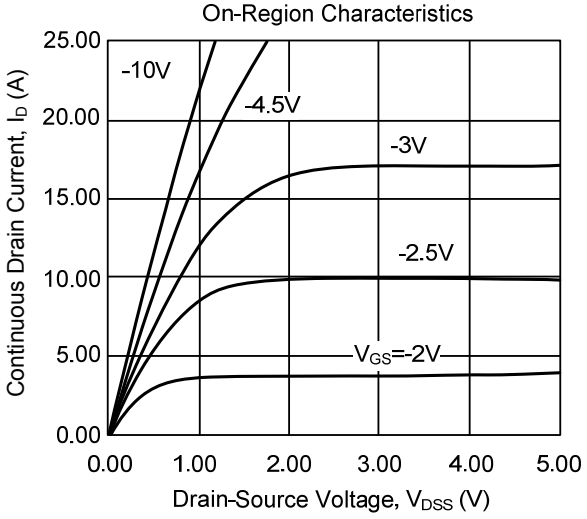
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.7	-1	-1.3	V
Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.2A		42	50	mΩ
		V_{GS}=-4.5V, I_D=-4A		53	65	mΩ
		V_{GS}=-2.5V, I_D=-1A		80	120	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS} =0V, V_{DS} =-15V, f=1MHz		954		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			77		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_G =6Ω		6.3		ns
Turn-ON Rise Time	t_R			3.2		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			38.2		ns
Turn-OFF Fall Time	t_F			12		ns
Total Gate Charge (Note 2)	Q_G	V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A		9.4		nC
Gate-Source Charge	Q_{GS}			2		nC
Gate-Drain Charge	Q_{GD}			3		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	V_{DS}=0V, I_S=-1A		-0.75	-1	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				-2.2	A
Reverse Recovery Time	t_{RR}	I_F=-4A, dI/dt=100A/μs		20.2		ns
Reverse Recovery Charge	Q_{RR}			11.2		nC

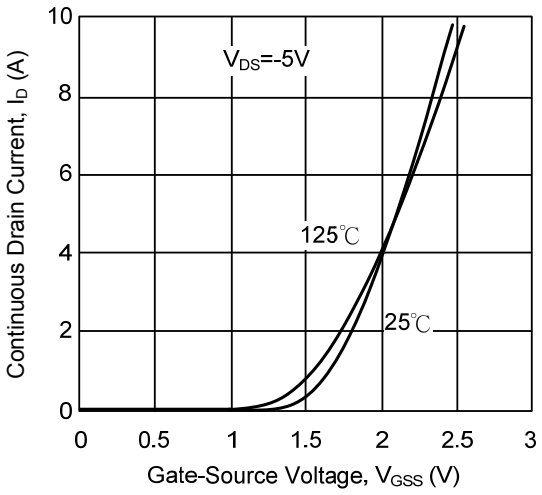
Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300μs, duty cycle ≤2%
3. Surface mounted on 1 in^2 copper pad of FR4 board

■ TYPICAL CHARACTERISTICS

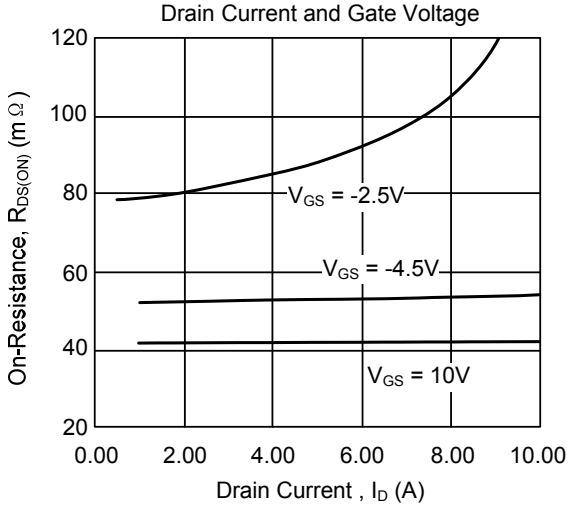
On-Region Characteristics



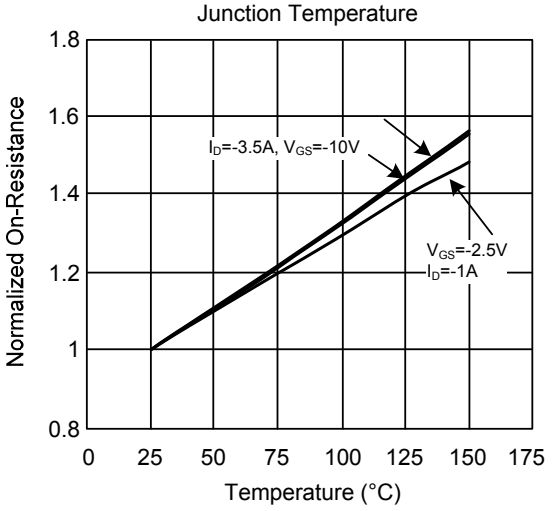
Transfer Characteristics



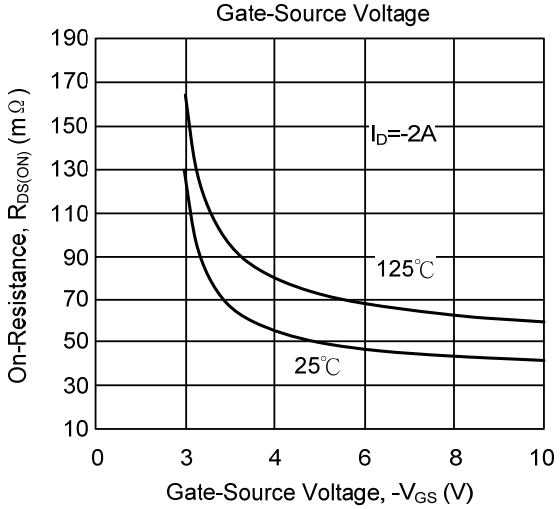
On-Resistance vs.
Drain Current and Gate Voltage



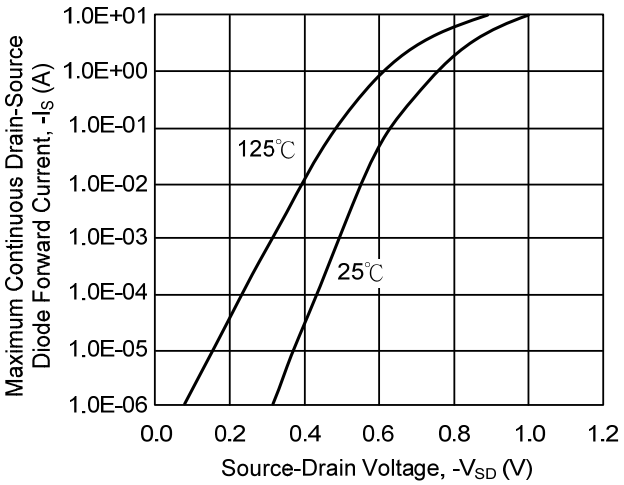
On-Resistance vs.
Junction Temperature



On-Resistance vs.
Gate-Source Voltage

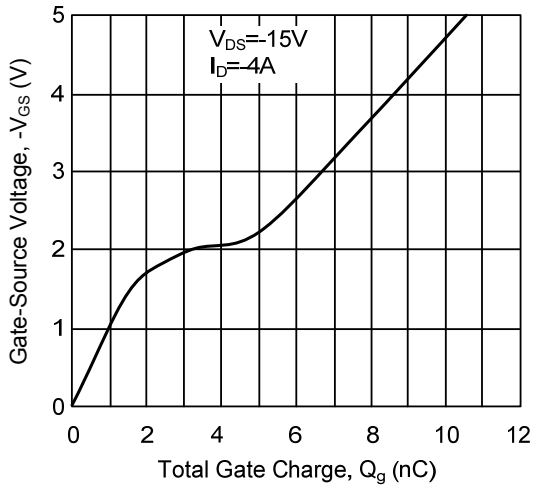


Body-Diode Characteristics

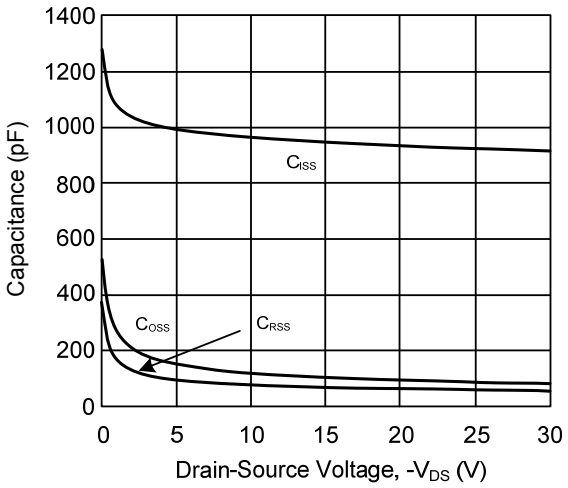


■ TYPICAL CHARACTERISTICS(Cont.)

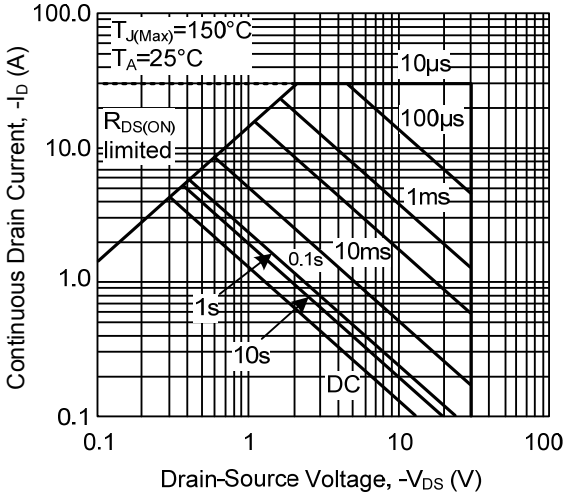
Gate-Charge Characteristics



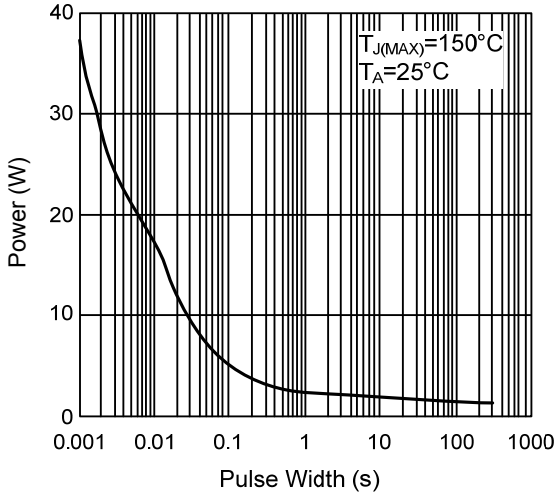
Capacitance Characteristics



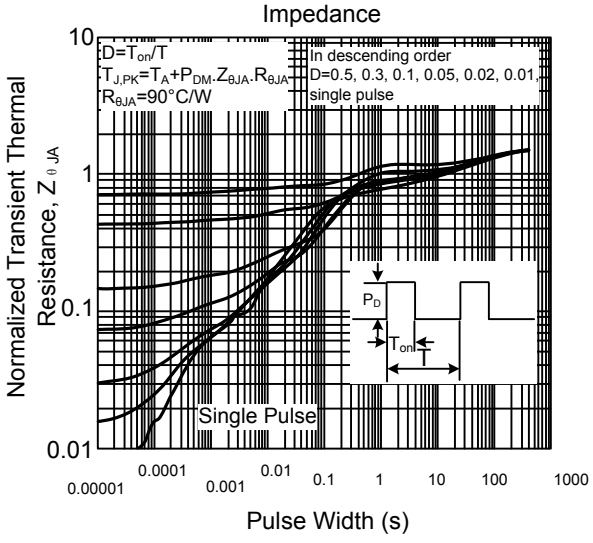
Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance



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