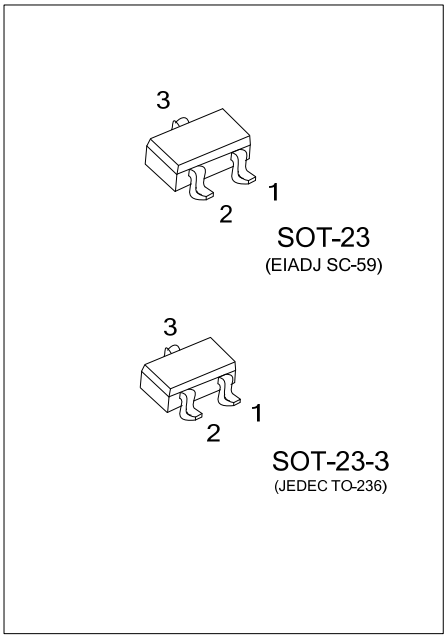
UT2302

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

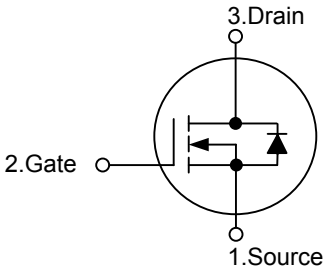


■ DESCRIPTION

The UTC **UT2302** is N-channel Power MOSFET, designed with high density cell, with fast switching speed, ultra low on-resistance, and excellent thermal and electrical capabilities.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UT2302G-AE2-R	SOT-23-3	S	G	D	Tape Reel
UT2302G-AE3-R	SOT-23	S	G	D	Tape Reel

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

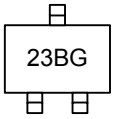
UT2302G-AE3-R

(1)Packing Type — (1) R: Tape Reel

(2)Package Type — (2) AE2: SOT-23-3, AE3: SOT-23

(3)Green Package — (3) G: Halogen Free and Lead Free

■ MARKING



Copyright © 2015 Unisonic Technologies Co., Ltd

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current (Note 1)	Continuous	I_D	2.4	A
	Pulsed	I_{DM}	10	A
Power Dissipation		P_D	1.25	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	RATINGS	UNIT
Junction to Ambient (Note 3)	θ_{JA}	100	°C/W

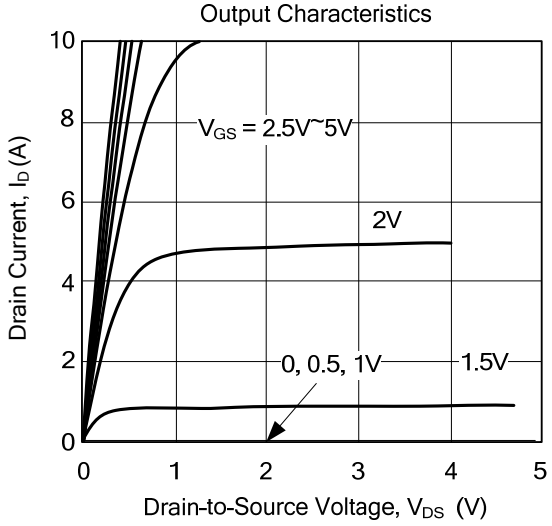
■ ELECTRICAL CHARACTERISTICS (Ta =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250 μA	20			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =20 V, V_{GS} =0 V			1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±8V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250 μA	0.45			V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} =4.5 V, I_D =7.2 A			50	mΩ
		V_{GS} =2.5 V, I_D =3.1 A		75	95	mΩ
On State Drain Current (Note2)	$I_{D(ON)}$	V_{DS} ≥ 5V, V_{GS} =4.5 V	6			A
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =10 V, V_{GS} =0V, f=1MHz		450		pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			43		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD} =10V, R_L =10 Ω, I_D=1A, V_{GEN} =4.5V, R_G =6Ω		7	15	ns
Turn-ON Rise Time	t_R			55	80	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			16	60	ns
Turn-OFF Fall-Time	t_F			10	25	ns
Total Gate Charge	Q_G	V_{DS} =10V, V_{GS} =4.5 V, I_D=3.6 A		5.2	10	nC
Gate-Source Charge	Q_{GS}			0.65		nC
Gate-Drain Charge	Q_{GD}			1.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} =0 V, I_S =1.0 A		0.76	1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				1.6	A

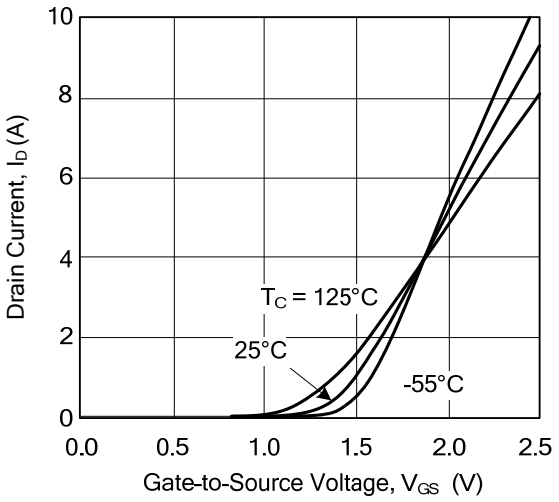
Notes: 1. Repetitive Rating: Pulse width limited by T_J
2. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
3. Surface mounted on 1 in^2 copper pad of FR4 board

■ TYPICAL CHARACTERISTICS

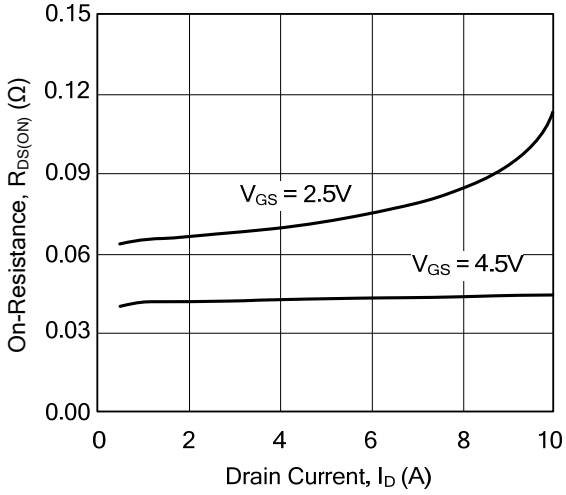
Output Characteristics



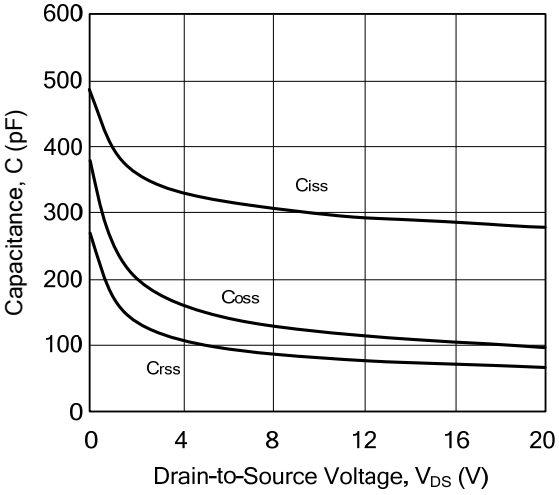
Transfer Characteristics



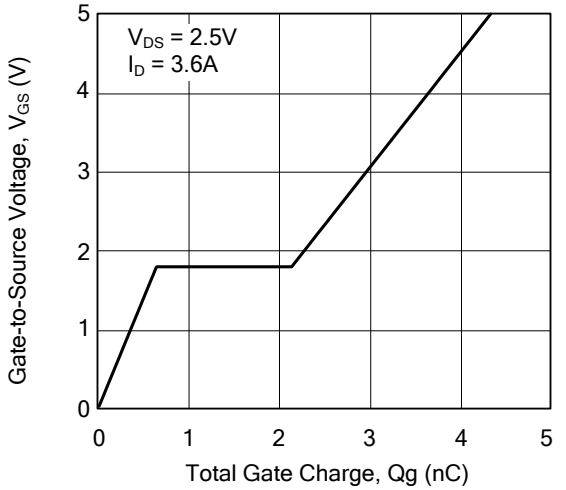
On-Resistance vs. Drain Current



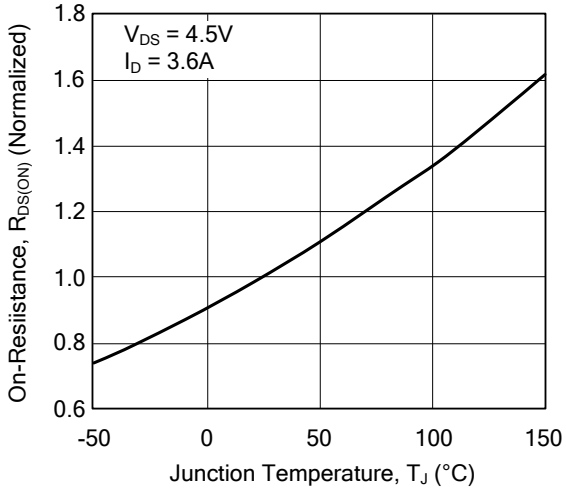
Capacitance Characteristics



Gate Charge Characteristics

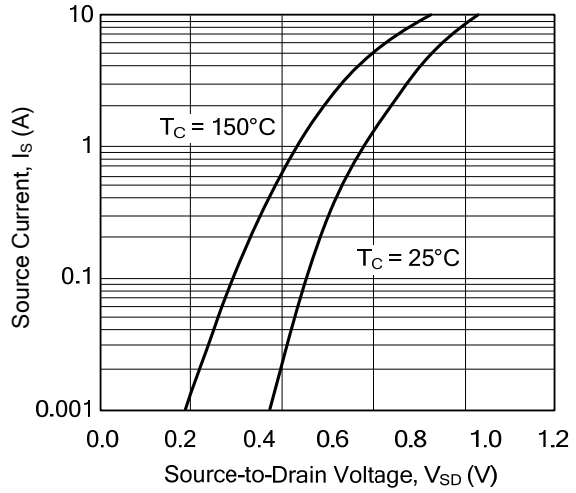


On-Resistance vs. Junction Temperature

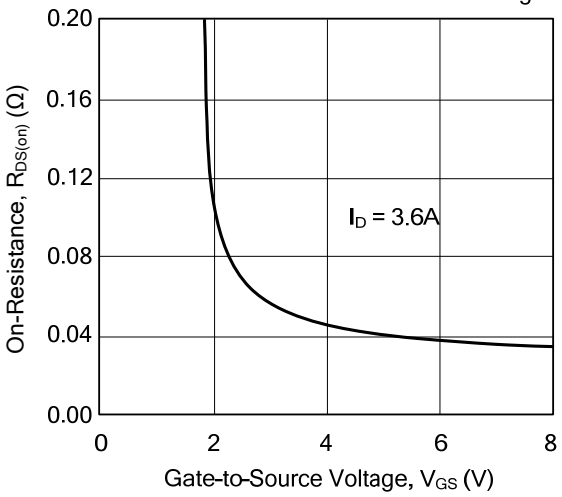


■ TYPICAL CHARACTERISTICS(Cont.)

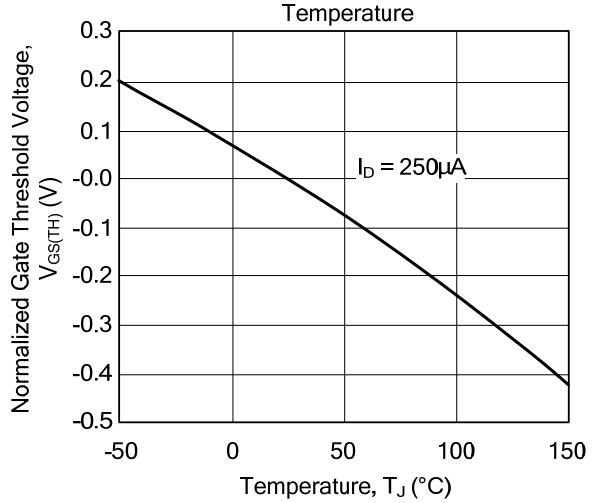
Source-Drain Diode Forward Voltage



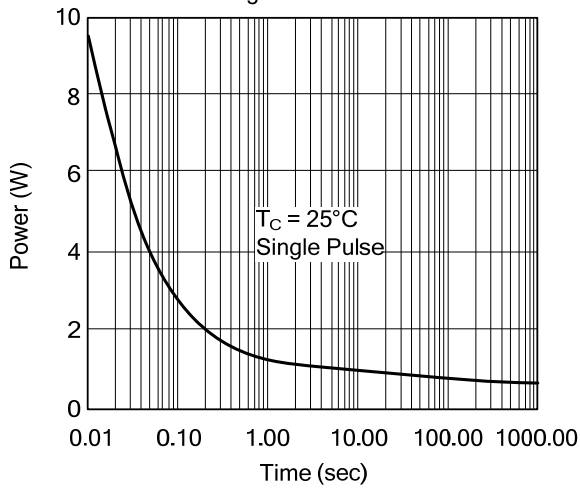
On-Resistance vs. Gate-to-Source Voltage



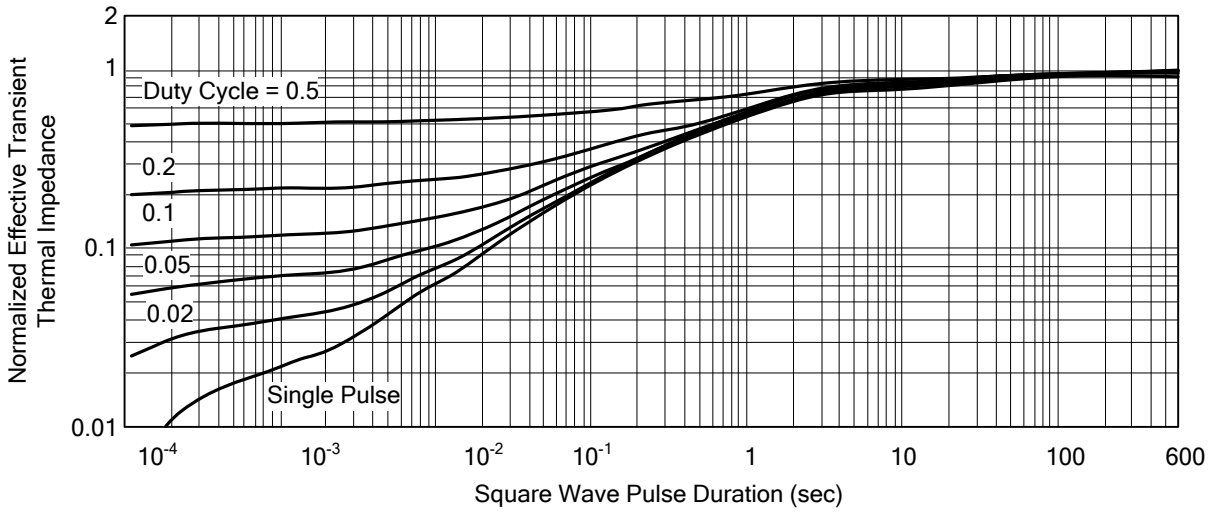
Normalized Gate Threshold Voltage vs. Temperature



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.