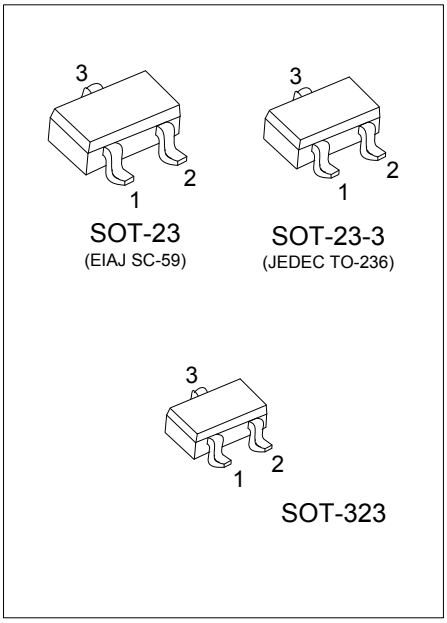
UT2302

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

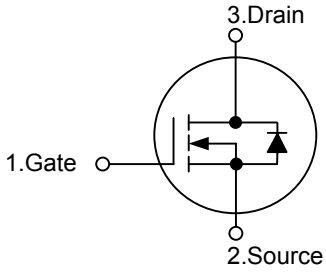


■ DESCRIPTION

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



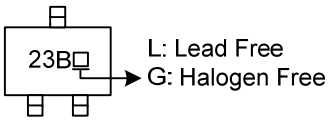
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2302L-AE2-R	UT2302G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2302L-AE3-R	UT2302G-AE3-R	SOT-23	G	S	D	Tape Reel
UT2302L-AL3-R	UT2302G-AL3-R	SOT-323	G	S	D	Tape Reel

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

UT2302G-AE2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23, AL3: SOT-323 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=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	SOT-23-3	P_D	0.5	W
	SOT-323		0.4	W
	SOT-23		0.6	W
Junction Temperature		T_J	-40 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	250	°C/W
	SOT-323		312	°C/W
	SOT-23		208	°C/W

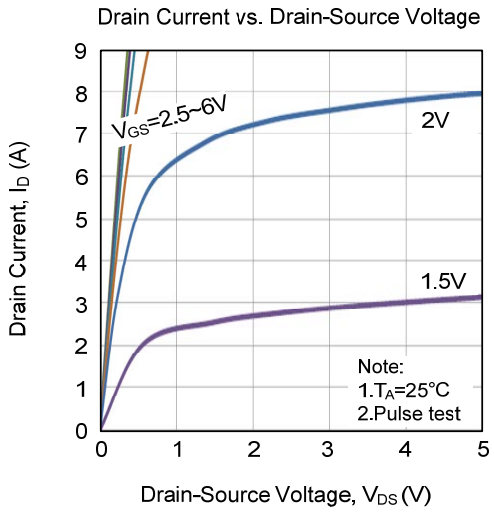
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

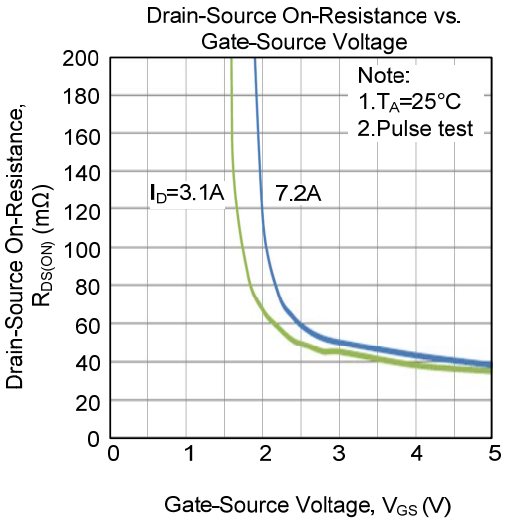
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

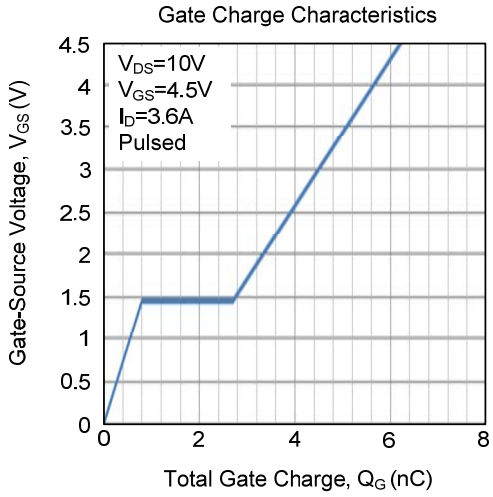
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V			1.0	μA
Gate-Source Leakage Current		I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
ON CHARACTERISTICS							
Gate-Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.45		1.2	V
Static Drain-Source On-State Resistance	SOT-23	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=7.2A			50	mΩ
	SOT-323					80	mΩ
	SOT-23		V_{GS}=2.5V, I_D=3.1A			95	mΩ
	SOT-323					115	mΩ
On State Drain Current (Note2)		$I_{D(ON)}$	V_{DS}≥5.0V, V_{GS}=4.5V	6			A
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS} =10V, V_{GS}=0V, f=1MHz		229		pF
Output Capacitance		C_{OSS}			67		pF
Reverse Transfer Capacitance		C_{RSS}			57		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A		6.2	10	nC
Gate-Source Charge		Q_{GS}			0.8		nC
Gate-Drain Charge		Q_{GD}			1.9		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=10V, R_L=10Ω, I_D=1.0A, V_{GEN}=4.5V, R_G=6Ω		5		ns
Turn-ON Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			14		ns
Turn-OFF Fall-Time		t_F			21		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				1.6	A
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=1.0A		0.76	1.2	V

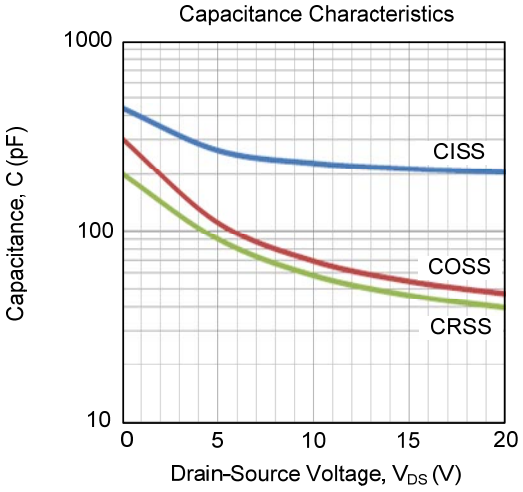
Notes: 1. Repetitive rating, pulse width limited by junction temperature.
2. Pulse Test: Pulse width ≤ 300 μs, Duty cycle ≤ 2 %

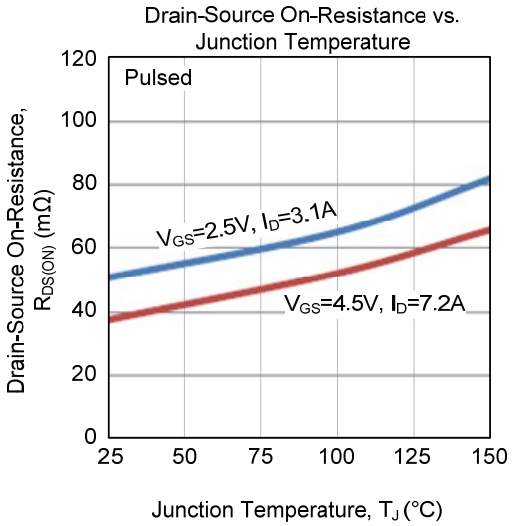
■ TYPICAL CHARACTERISTICS

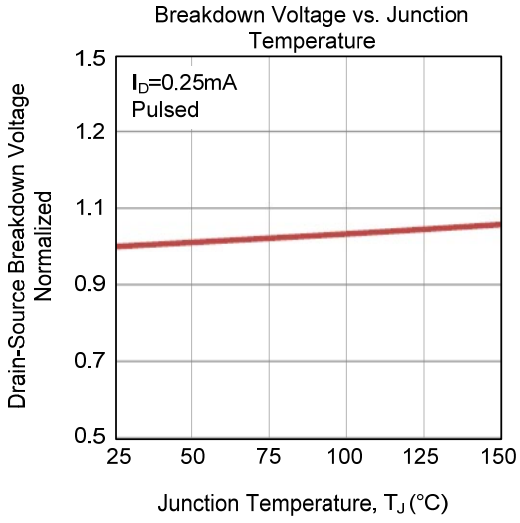






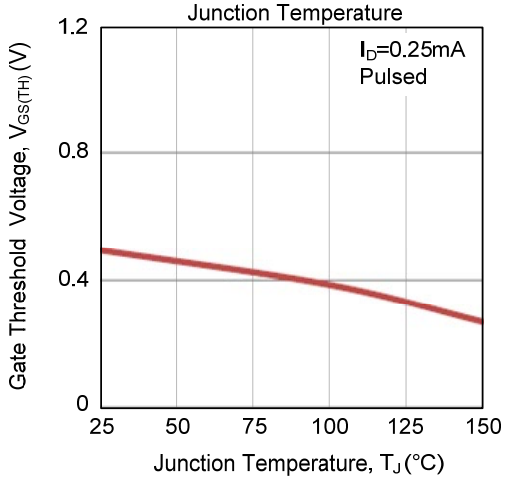




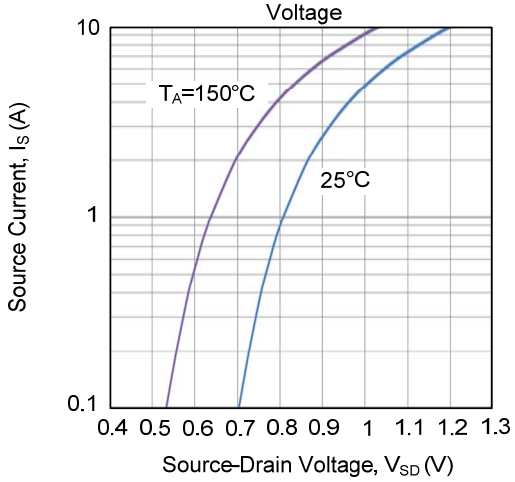


■ TYPICAL CHARACTERISTICS (Cont.)

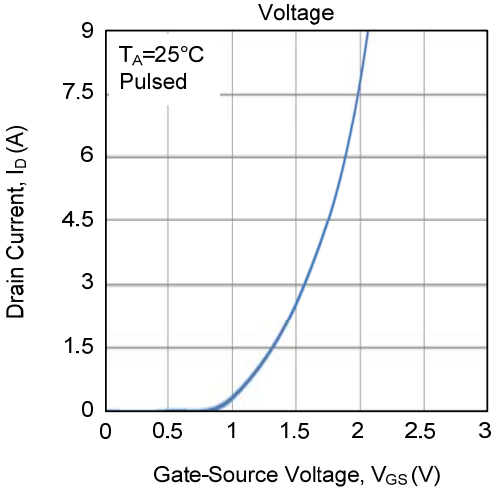
Gate Threshold Voltage vs. Junction Temperature



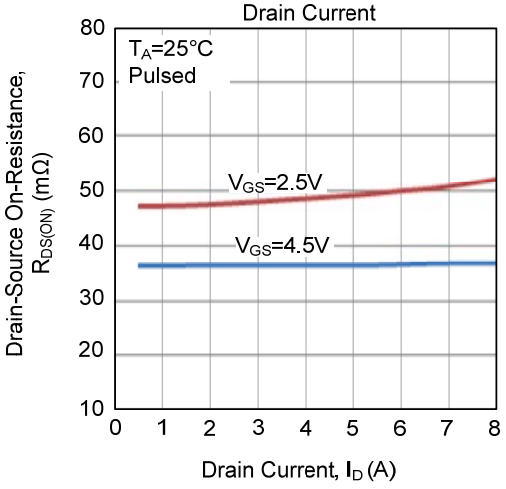
Source Current vs. Source-Drain Voltage



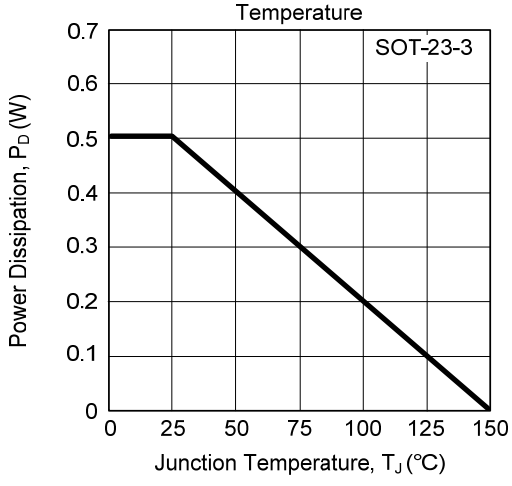
Drain Current vs. Gate-Source Voltage



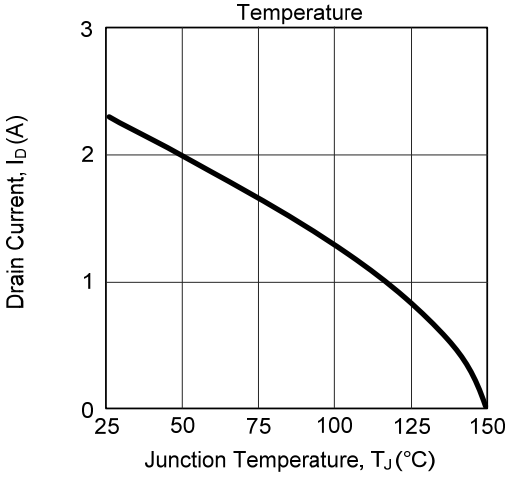
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)