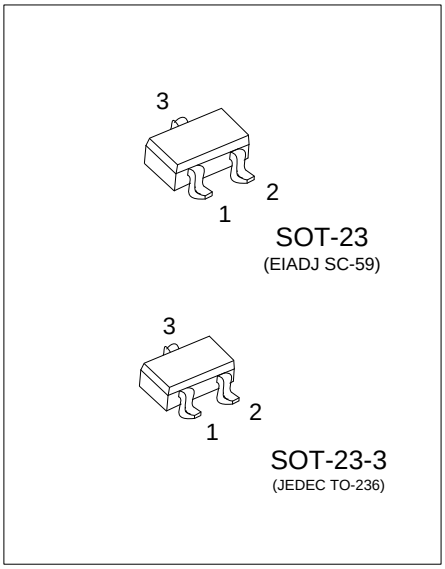
UT2302

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

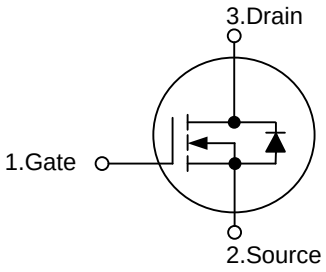


■ DESCRIPTION

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



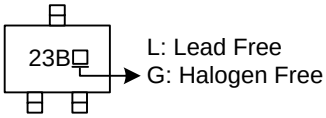
■ ORDERING INFORMATION

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

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

UT2302G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23 (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		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 CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	100	°C/W

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

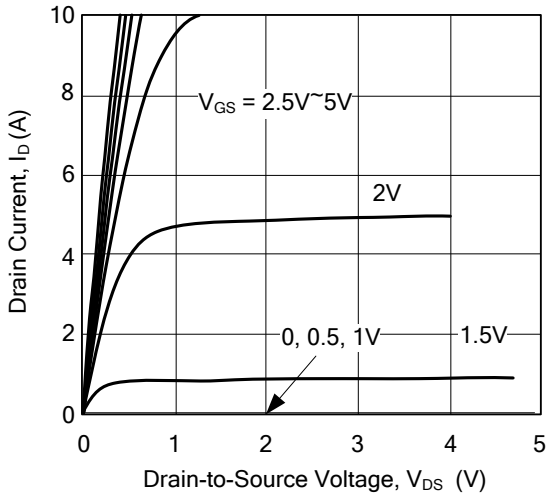
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =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		1.2	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						
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
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
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} =0 V, I_S =1.0 A		0.76	1.2	V

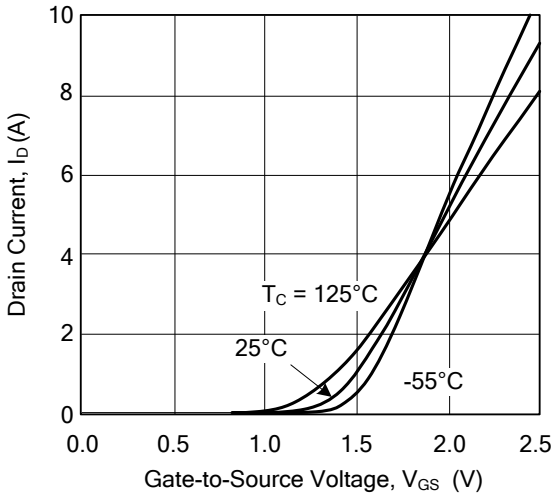
Notes: 1. Repetitive rating, pulse width limited by junction temperature.
2. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

■ TYPICAL CHARACTERISTICS

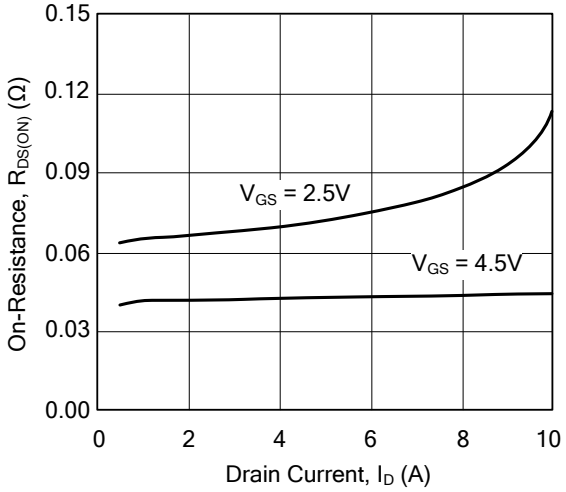
Output Characteristics



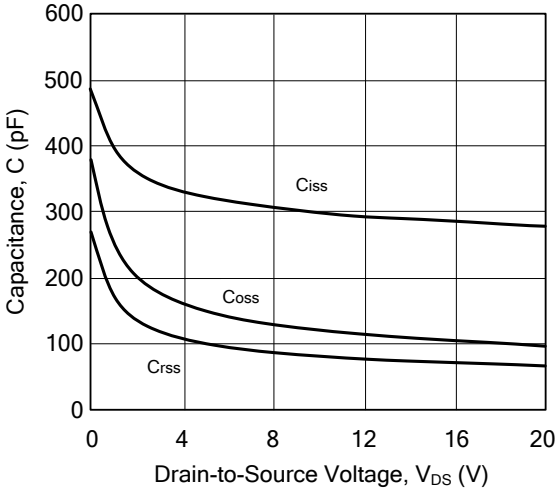
Transfer Characteristics



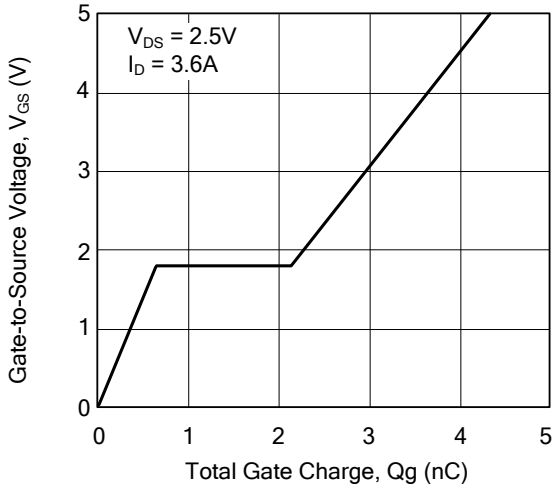
On-Resistance vs. Drain Current



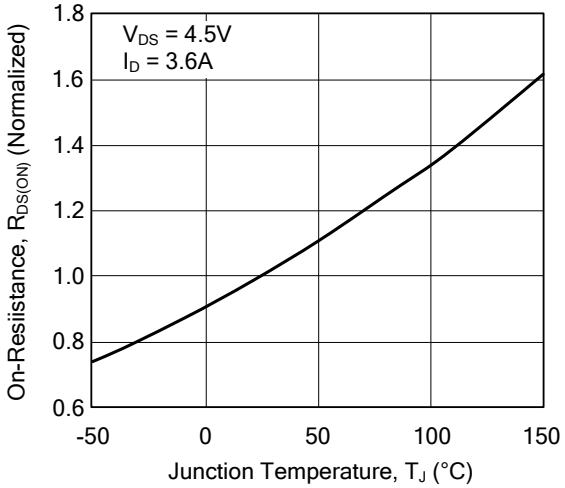
Capacitance Characteristics



Gate Charge Characteristics

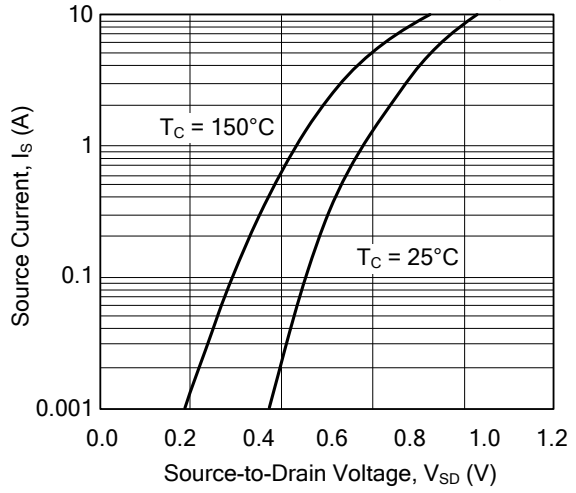


On-Resistance vs. Junction Temperature

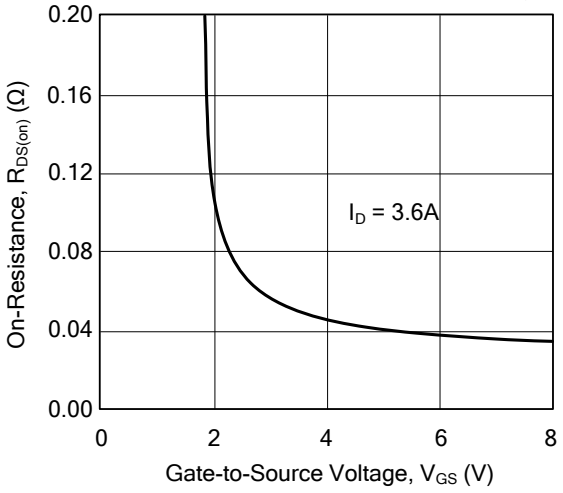


■ TYPICAL CHARACTERISTICS (Cont.)

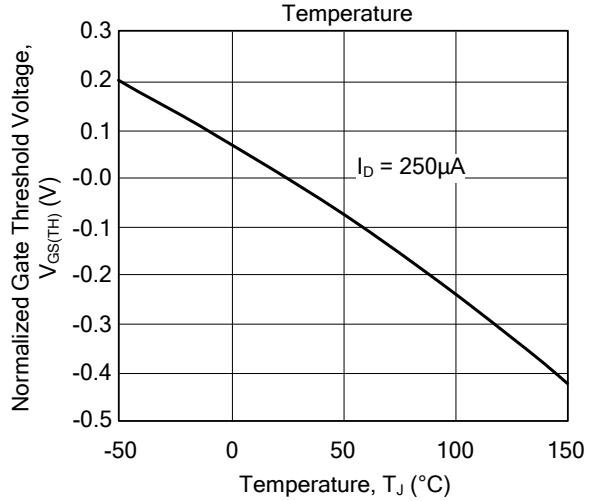
Source-Drain Diode Forward Voltage



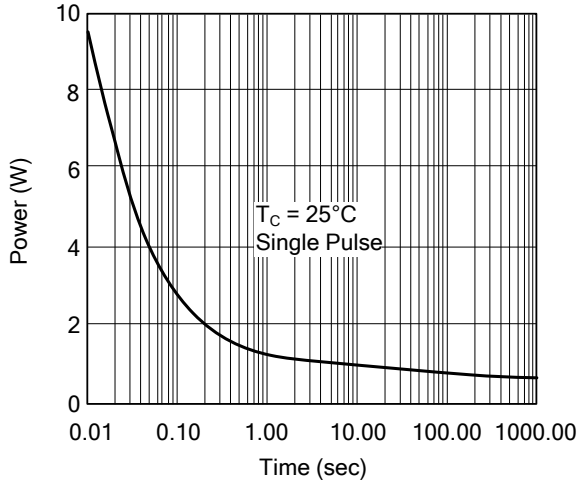
On-Resistance vs. Gate-to-Source Voltage



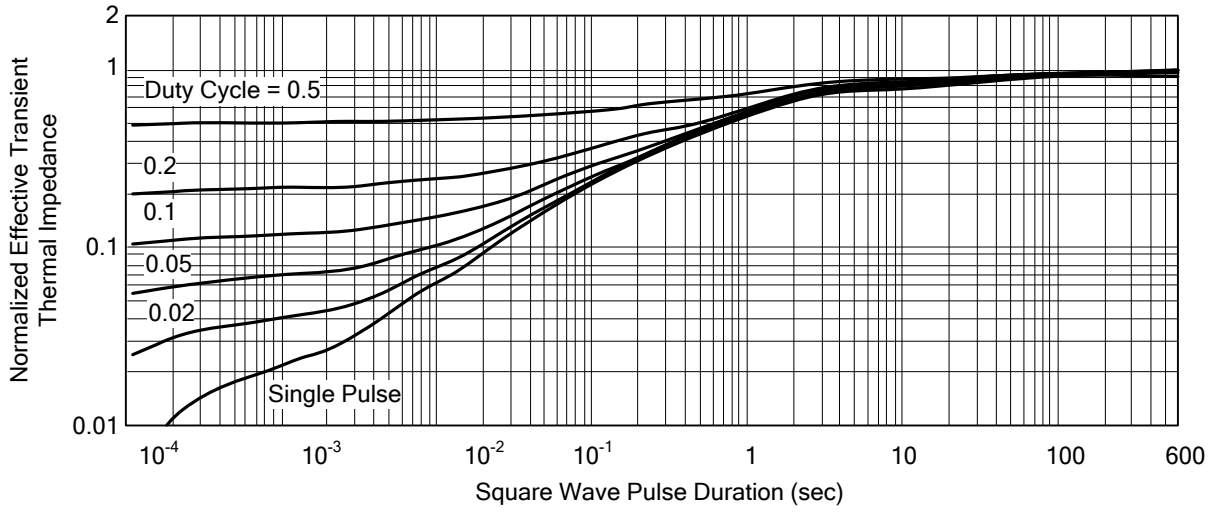
Normalized Gate Threshold Voltage vs. Temperature



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



■ TYPICAL CHARACTERISTICS (Cont.)