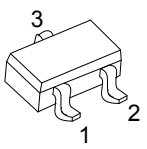
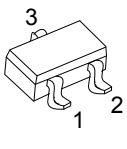
UT2301

Power MOSFET

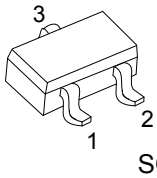
-2.8A, -20V P-CHANNEL ENHANCEMENT MODE POWER MOSFET



SOT-23-3
(JEDEC TO-236)



SOT-323



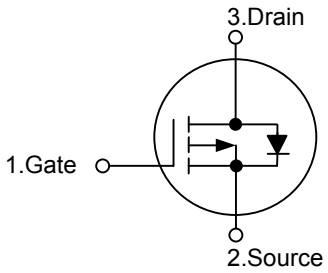
SOT-23
(EIAJ SC-59)

■ DESCRIPTION

The UTC **UT2301** is P-channel enhancement mode power MOSFET, designed in serried ranks. With fast switching speed, low on-resistance, favorable stabilization.

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

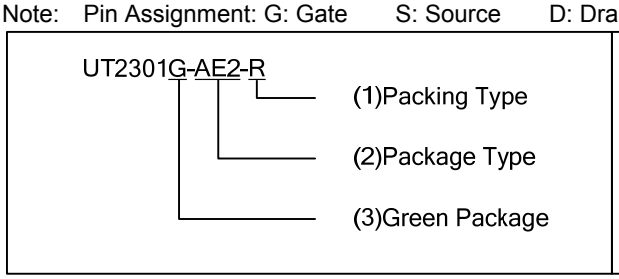
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2301L-AE2-R	UT2301G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2301L-AE3-R	UT2301G-AE3-R	SOT-23	G	S	D	Tape Reel
UT2301L-AL3-R	UT2301G-AL3-R	SOT-323	G	S	D	Tape Reel

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

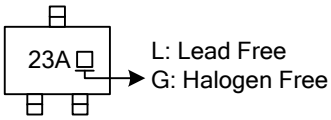


(1) R: Tape Reel

(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	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±8	V
Continuous Drain Current	Continuous	I_D	-2.8	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-8.4	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	63	mJ
Total Power Dissipation		P_D	1.14	W
Junction Temperature		T_J	+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.
3. L=16mH, I_{AS}=-2.8A, V_{DD}= -20V, R_G=25Ω, Starting T_J=25°C.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	110	°C/W

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

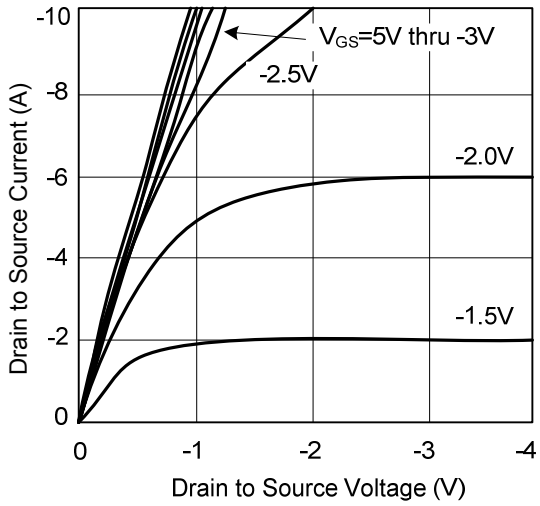
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-20			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.45			V
Static Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-2.8A			130	mΩ
		V_{GS}=-2.5V, I_D=-2.0A			190	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		630		pF
Output Capacitance	C_{OSS}			110		pF
Reverse Transfer Capacitance	C_{RSS}			90		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q_G	V_{DS}=-16V, V_{GS}=-10V, I_D=-2.8A, I_D=-1mA		30.5		nC
Gate-Source Charge	Q_{GS}			3.6		nC
Gate-Drain Charge	Q_{GD}			2.0		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	V_{DS}=-10V, V_{GS}=-10V, I_D=-2.8A, R_G=6Ω		7.2		ns
Turn-ON Rise Time	t_R			3.8		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			32		ns
Turn-OFF Fall Time	t_F			13		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				-1.6	A
Maximum Body-Diode Pulsed Current	I_{SM}				-8.4	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	V_{GS}=0V, I_S=-1.6A		-0.8	-1.2	V

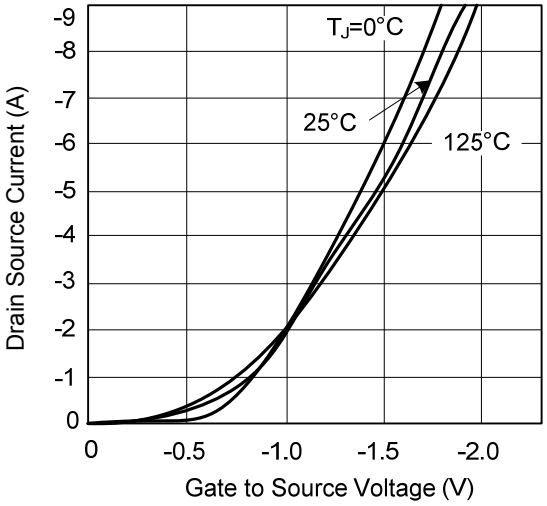
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS

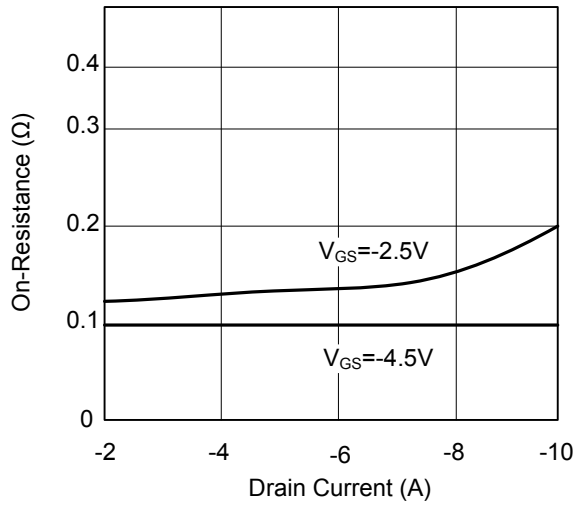
Output Characteristic



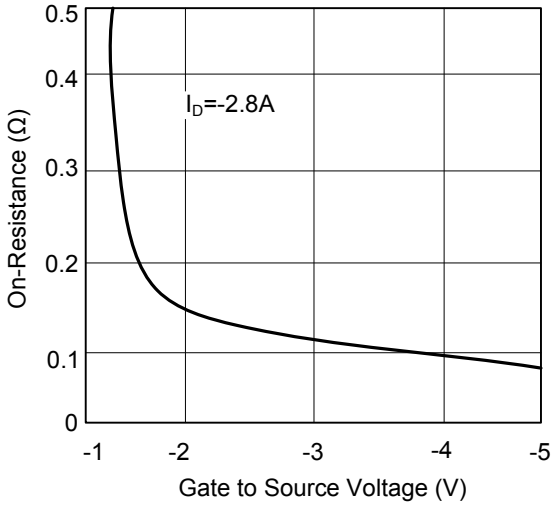
Transfer Characteristic



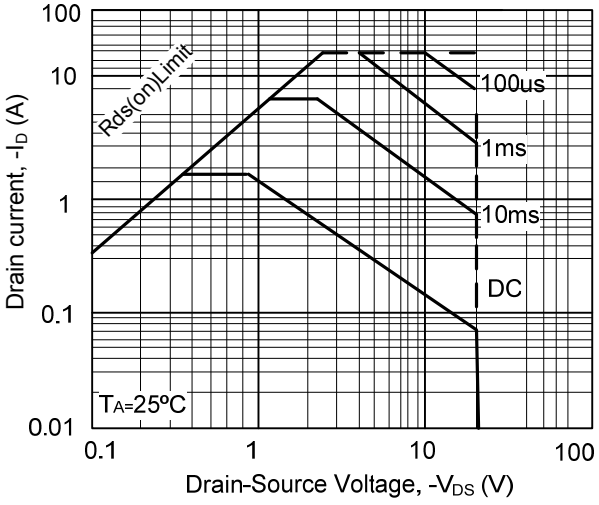
On Resistance vs. Drain Current



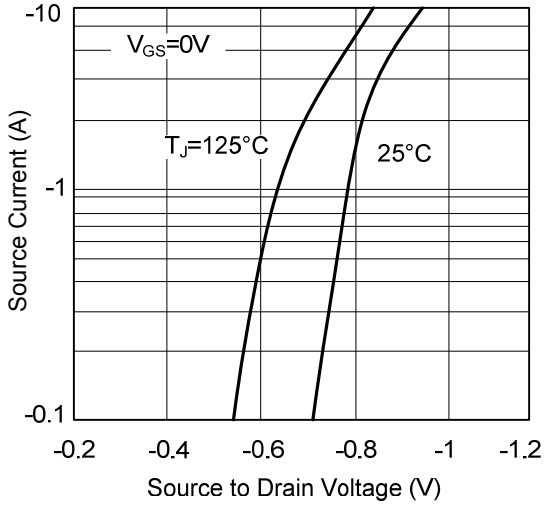
On Resistance vs. Gate-Source



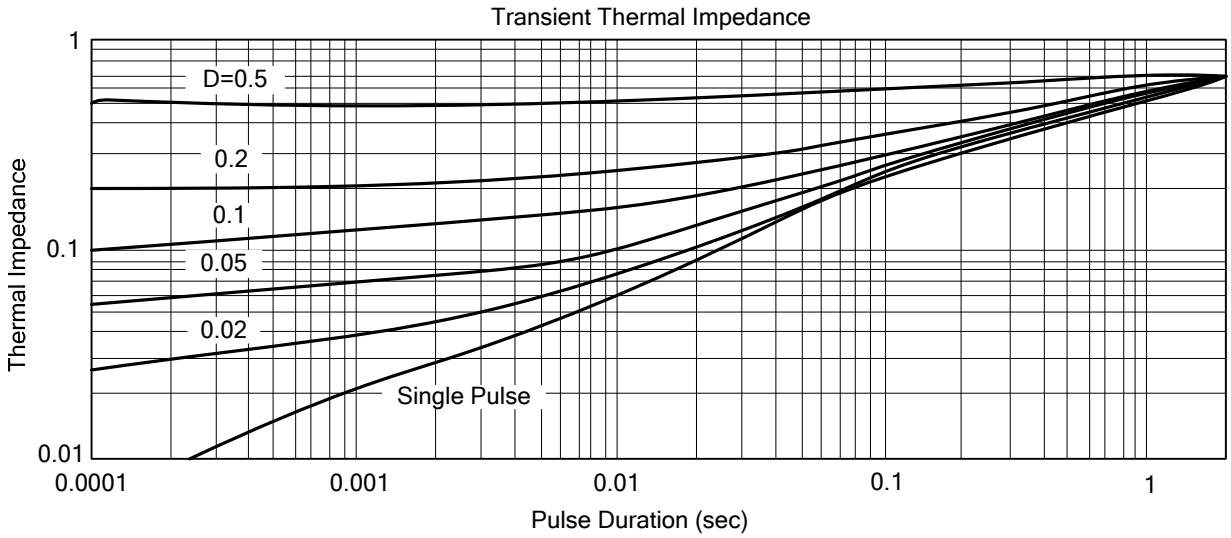
Power Dissipatio vs. Ambient Temperature

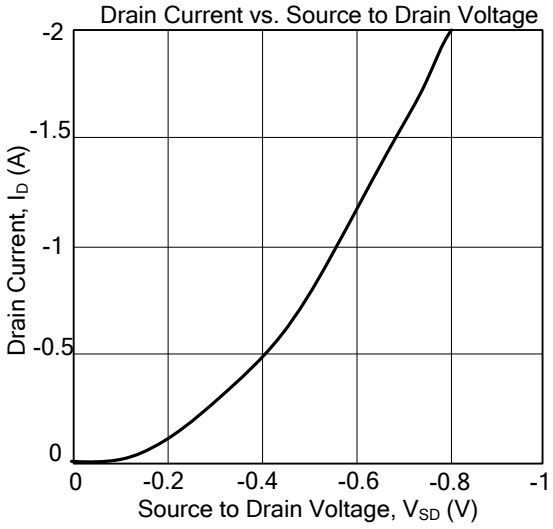


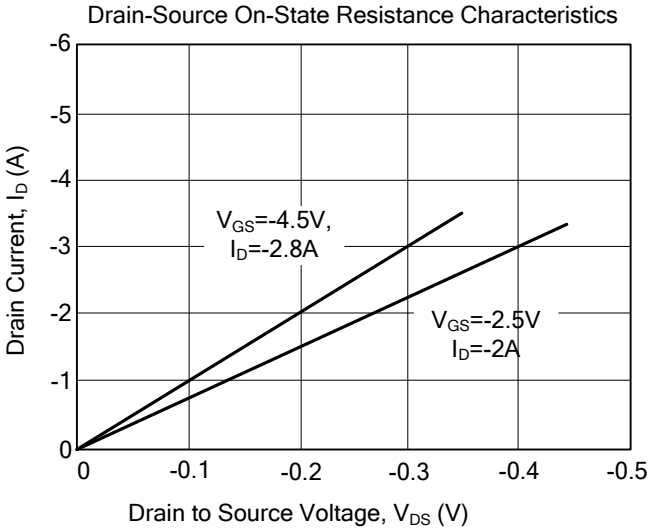
Source Drain Diode Forward Voltage

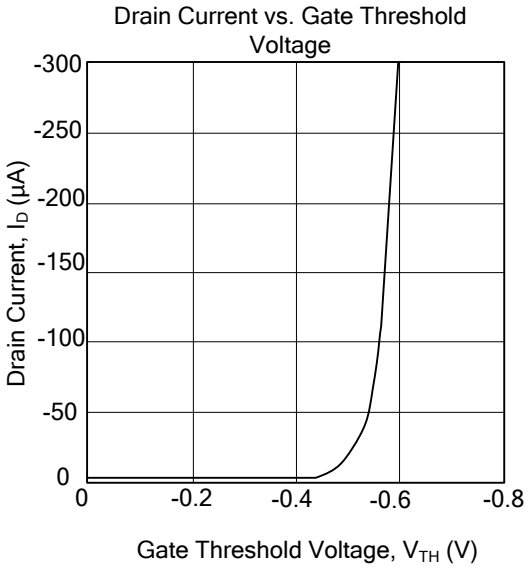


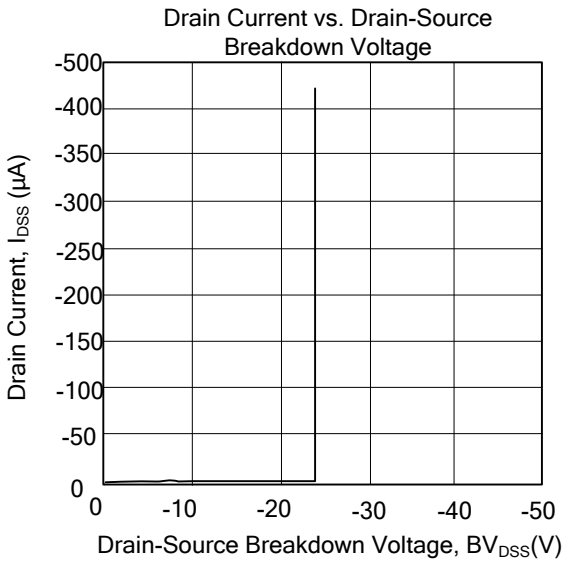
■ TYPICAL CHARACTERISTICS (Cont.)











■ TYPICAL CHARACTERISTICS (Cont.)