



## UT2312

Power MOSFET

### 20V N-CHANNEL ENHANCEMENT MODE MOSFET

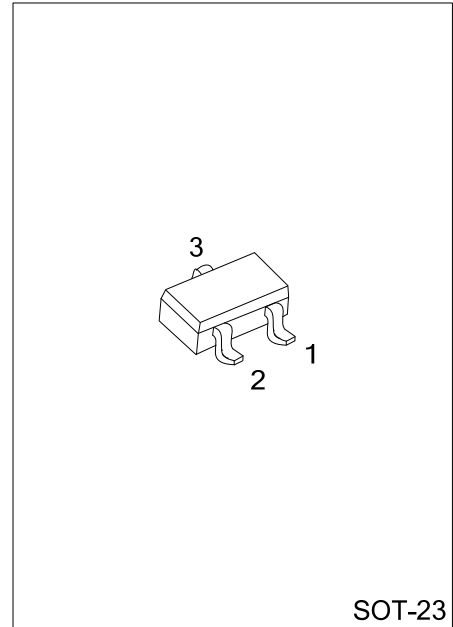
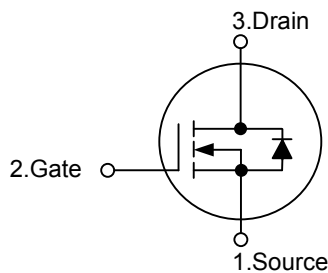
#### DESCRIPTION

The **UT2312** uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \*  $R_{DS(ON)} = 33\text{ m}\Omega$  @  $V_{GS} = 4.5\text{ V}$
- \*  $R_{DS(ON)} = 40\text{ m}\Omega$  @  $V_{GS} = 2.5\text{ V}$
- \* Advanced trench process technology
- \* Excellent thermal and electrical capabilities
- \* High density cell design for ultra low on-resistance

#### SYMBOL



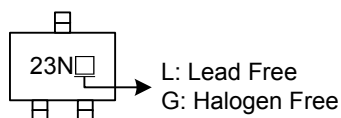
SOT-23

#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2312L-AE3-R	UT2312G-AE3-R	SOT-23	S	G	D	Tape Reel

UT2312L-AE3-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) AE3: SOT-23
		(3)Lead Plating	(3) G: Halogen Free, L: Lead Free

#### MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±8	V
Continuous Drain Current	$I_D$	5	A
Pulsed Drain Current	$I_{DM}$	15	A
Power Dissipation (Ta =25°C)	$P_D$	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

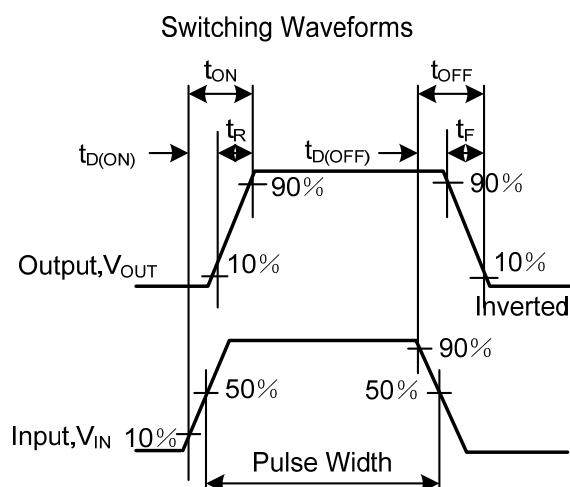
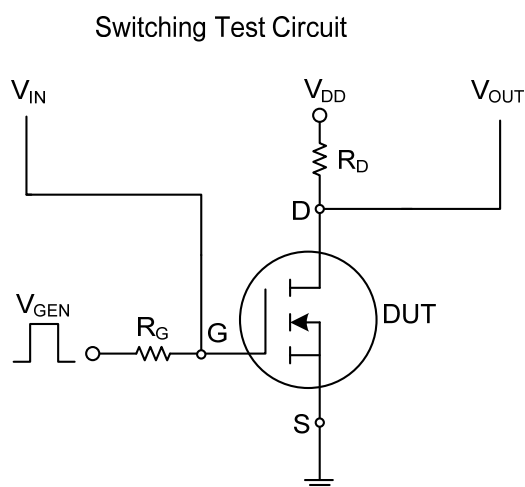
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	$\theta_{JA}$			100	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20 V, V <sub>GS</sub> =0 V			1.0	μA
Gate–Body Leakage, Forward	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> = 0 V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	0.45			V
Static Drain–Source On–Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0 A		25	33	mΩ
		V <sub>GS</sub> =2.5 V, I <sub>D</sub> =4.0 A		35	40	mΩ
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> ≥10 V, V <sub>GS</sub> = 4.5 V	15			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 5.0 A		20		S
DYNAMIC PARAMETERS						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1.0MHz		900		pF
Output Capacitance	C <sub>OSS</sub>			140		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			100		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A		11	14	nC
Gate Source Charge	Q <sub>GS</sub>			1.4		nC
Gate Drain Charge	Q <sub>GD</sub>			2.2		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =1A, R <sub>L</sub> =10Ω V <sub>GEN</sub> =4.5V, R <sub>G</sub> =6Ω		15	25	ns
Turn-ON Rise Time	t <sub>R</sub>			40	60	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			48	70	ns
Turn-OFF Fall-Time	t <sub>F</sub>			31	45	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0 A,V <sub>GS</sub> =0 V		0.75	1.2	V
Max. Diode Forward Current	I <sub>S</sub>				1.6	A

Notes: Pulse test; pulse width ≤300μs, duty cycle≤2%

## ■ TEST CIRCUIT AND WAVEFORM



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