



UT2312

Power MOSFET

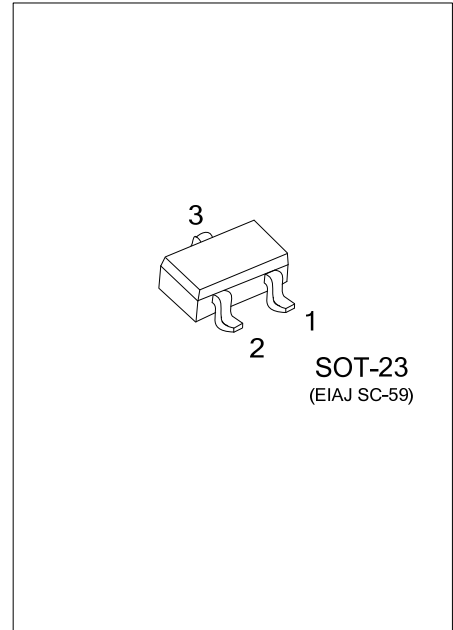
5A, 20V N-CHANNEL ENHANCEMENT MODE MOSFET

DESCRIPTION

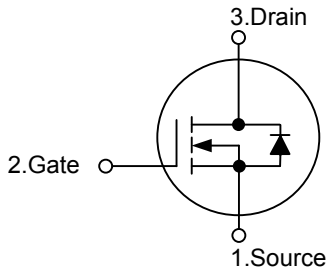
The **UT2312** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} < 33 \text{ m}\Omega @ V_{GS} = 4.5\text{V}, I_D = 5.0 \text{ A}$
- * $R_{DS(ON)} < 40 \text{ m}\Omega @ V_{GS} = 2.5 \text{ V}, I_D = 4.0 \text{ A}$
- * Advanced trench process technology
- * Excellent thermal and electrical capabilities
- * High density cell design for ultra low on-resistance



SYMBOL



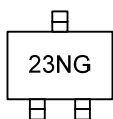
ORDERING INFORMATION

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

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

<p>UT2312G-AE3-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free and Lead Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Continuous Drain Current	I_D	5	A
Pulsed Drain Current	I_{DM}	15	A
Power Dissipation ($T_A = 25^\circ\text{C}$) (Note 2)	P_D	1.25	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. Surface mounted on 1 in 2 copper pad of FR4 board.

■ THERMAL DATA

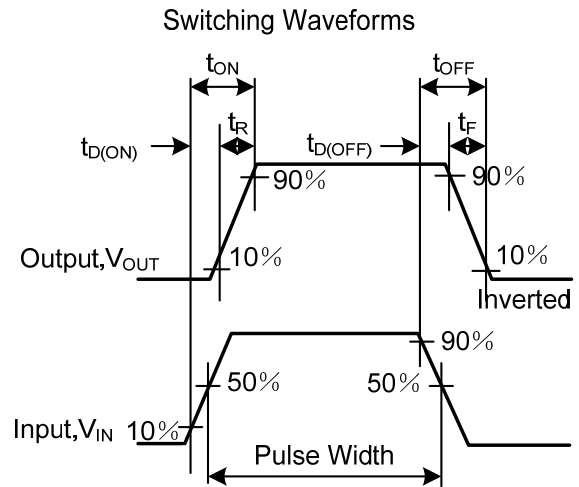
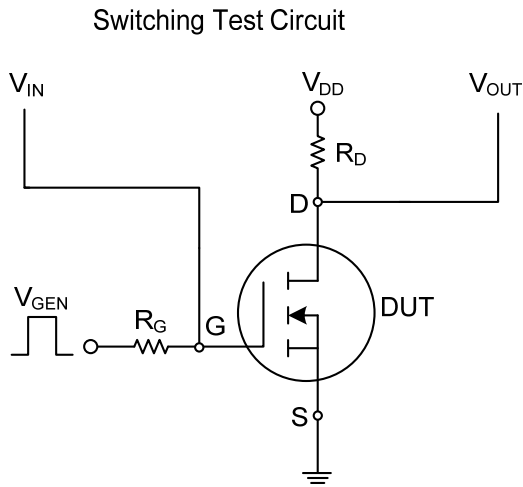
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	100	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{V}, I_D = 250 \mu\text{A}$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$			1.0	μA
Gate-Body Leakage, Forward	I_{GSS}	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	0.45			V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 4.5\text{V}, I_D = 5.0\text{A}$		25	33	m Ω
		$V_{GS} = 2.5\text{V}, I_D = 4.0\text{A}$		35	40	m Ω
On-State Drain Current	$I_{D(ON)}$	$V_{DS} \geq 10\text{V}, V_{GS} = 4.5\text{V}$	15			A
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 5.0\text{A}$		20		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$		900		pF
Output Capacitance	C_{OSS}			140		pF
Reverse Transfer Capacitance	C_{RSS}			100		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS} = 10\text{V}, V_{GS} = 4.5\text{V}, I_D = 3.6\text{A}$		11	14	nC
Gate Source Charge	Q_{GS}			1.4		nC
Gate Drain Charge	Q_{GD}			2.2		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = 10\text{V}, I_D = 1\text{A}, R_L = 10\Omega$ $V_{GEN} = 4.5\text{V}, R_G = 6\Omega$		15	25	ns
Turn-ON Rise Time	t_R			40	60	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			48	70	ns
Turn-OFF Fall-Time	t_F			31	45	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = 1.0\text{A}, V_{GS} = 0\text{V}$		0.75	1.2	V
Max. Diode Forward Current	I_S				1.6	A

Notes: Pulse test; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

■ TEST CIRCUIT AND WAVEFORM



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