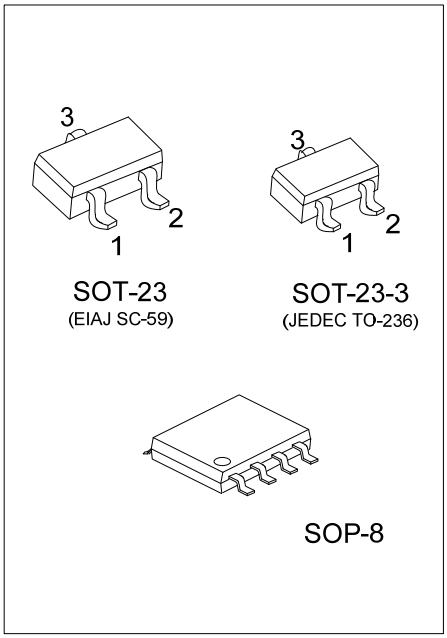
UT2312

Power MOSFET

5A, 20V N-CHANNEL ENHANCEMENT MODE MOSFET



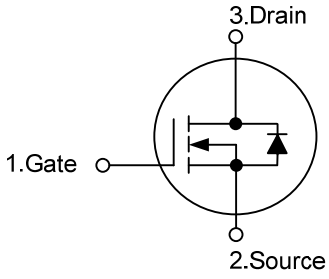
■ DESCRIPTION

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.

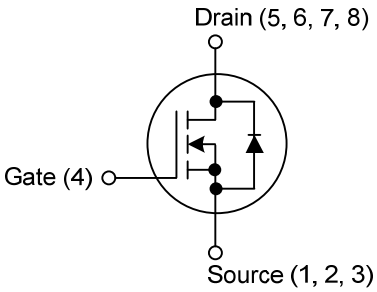
■ FEATURES

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

■ SYMBOL



SOT-23-3/SOT-23

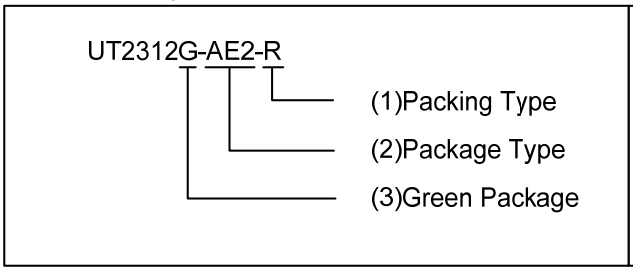


SOP-8

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT2312L-AE2-R	UT2312G-AE2-R	SOT-23-3	G	S	D	-	-	-	-	-	Tape Reel
UT2312L-AE3-R	UT2312G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT2312L-S08-R	UT2312G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

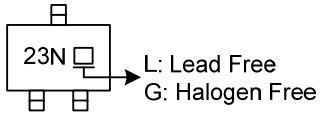
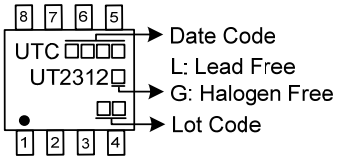


(1) R: Tape Reel

(2) AE2: SOT-23-3, AE3: SOT-23, S08: SOP-8

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-23-3 / SOT-23	SOP-8
	

■ 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
Continuous Drain Current		I_D	5	A
Pulsed Drain Current		I_{DM}	15	A
Power Dissipation (T_A =25°C) (Note 2)	SOT-23-3 SOT-23	P_D	1.25	W
	SOP-8		2	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. Surface mounted on 1 in 2 copper pad of FR4 board.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3 SOT-23	θ_{JA}	100	°C/W
	SOP-8		62.5	°C/W

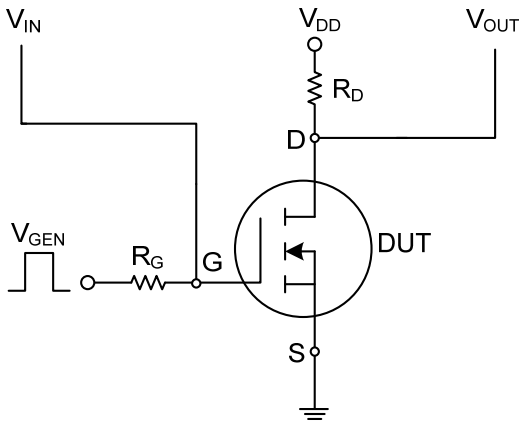
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250 μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20 V, V_{GS} =0 V			1	μA
Gate–Body Leakage, Forward	I_{GSS}	V_{GS} =±8V, V_{DS} = 0 V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250 μA	0.45			V
Static Drain–Source On–Resistance	$R_{DS(ON)}$	V_{GS} =4.5V, I_D =5.0 A		25	33	mΩ
		V_{GS} =2.5 V, I_D =4.0 A		35	40	mΩ
On-State Drain Current	$I_{D(ON)}$	V_{DS}≥10 V, V_{GS} = 4.5 V	15			A
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 5.0 A		20		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =10V, V_{GS} =0V, f=1.0MHz		900		pF
Output Capacitance	C_{OSS}			140		pF
Reverse Transfer Capacitance	C_{RSS}			100		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =10V, V_{GS} =4.5V, I_D =3.6A		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}=10V, I_D =1A, R_L =10Ω V_{GEN} =4.5V, R_G =6Ω		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						
Max. Diode Forward Current	I_S				1.6	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1.0 A,V_{GS}=0 V		0.75	1.2	V

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

■ TEST CIRCUIT AND WAVEFORM

Switching Test Circuit



Switching Waveforms