



UT2308Z

Power MOSFET

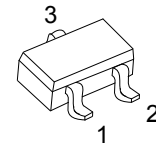
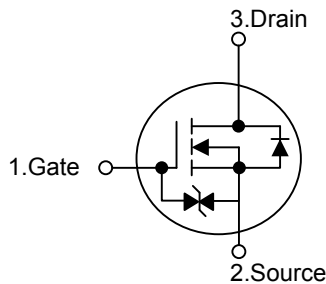
3.8A, 30V N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The UTC **UT2308Z** 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



SOT-23
(EIAJ SC-59)

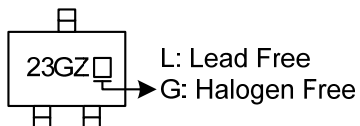
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2308ZL-AE3-R	UT2308ZG-AE3-R	SOT-23	G	S	D	Tape Reel

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

UT2308ZG-AE3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AE3: SOT-23
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	3.8	A
Power Dissipation	P_D	1.4	W
Junction Temperature	T_J	$-55 \sim +150$	$^\circ\text{C}$

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. Repetitive Rating: Pulse width limited by maximum junction temperature

■ 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} =0V, I _D =250μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.6		1.4	V
Static Drain-Source On-State Resistance (Note2)	R _{DS(ON)}	V _{GS} =4.5V, I _D =2.7A		54	70	mΩ
		V _{GS} =2.5V, I _D =1.0A		75	100	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1MHz		184		pF
Output Capacitance	C _{OSS}			22		pF
Reverse Transfer Capacitance	C _{RSS}			8		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	V _{DS} =15V, V _{GS} =4.5V, I _D =2.1A		4.7		nC
Gate Source Charge	Q _{GS}			1.9		nC
Gate-Drain Charge	Q _{GD}			1.6		nC
Turn-On Delay Time	t _{D(ON)}	V _{DD} =15V, R _L =15Ω, I _D =1.0A, V _{GS} =10V, R _G =6Ω		97.2		ns
Turn-On Rise Time	t _R			128		ns
Turn-Off Delay Time	t _{D(OFF)}			2600		ns
Turn-Off Fall Time	t _F			677		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =3.4A		0.8	1.2	V

Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Surface mounted on FR4 board $t \leq 5$ sec.

D.U.T.

V_{DS}

I_{SD}

L

V_{DD}

Driver

R_G

V_{GS}

Same Type as D.U.T.

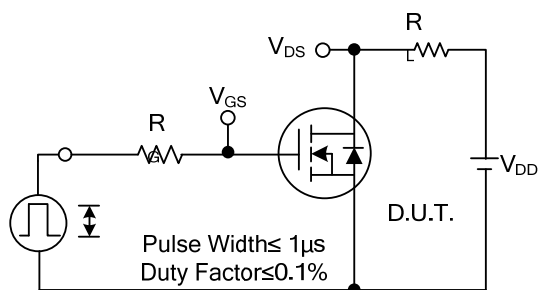
- * dv/dt controlled by R_G
- * I_{SD} controlled by pulse period
- * D.U.T.-Device Under Test

Timing diagram for a MOSFET body diode test. The diagram shows three waveforms:

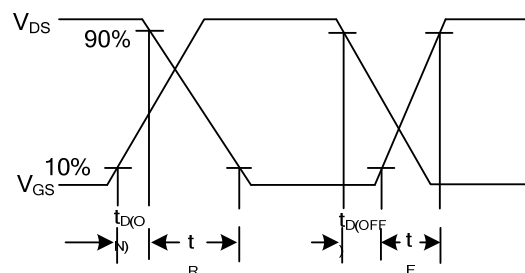
- V_{GS} (Driver):** A pulse with width $D = \frac{\text{Gate Pulse Width}}{\text{Gate Pulse Period}}$ and amplitude $10V$.
- I_{SD} (DUT):** Shows the body diode forward current I_{FM} , reverse current I_{RM} , and the rate of change of current di/dt .
- V_{DS} (DUT):** Shows the body diode forward voltage drop V_{SD} and the recovery dv/dt .

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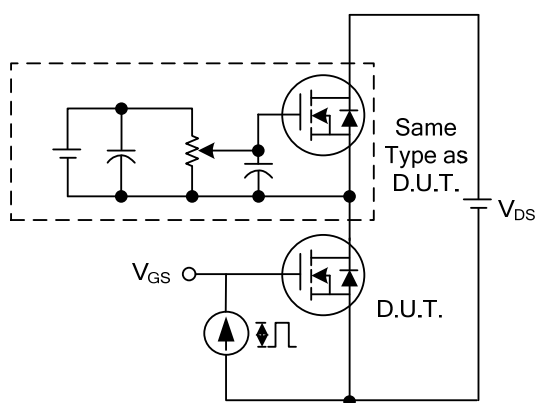
■ TEST CIRCUITS AND WAVEFORMS



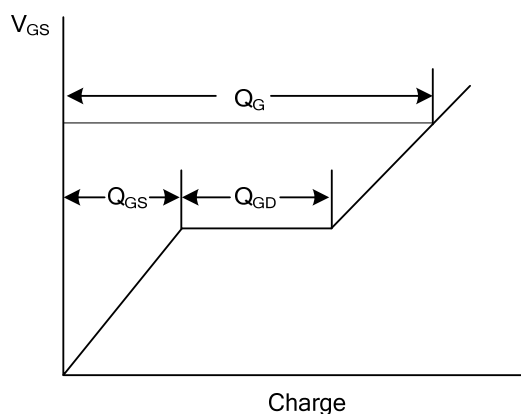
Switching Test Circuit



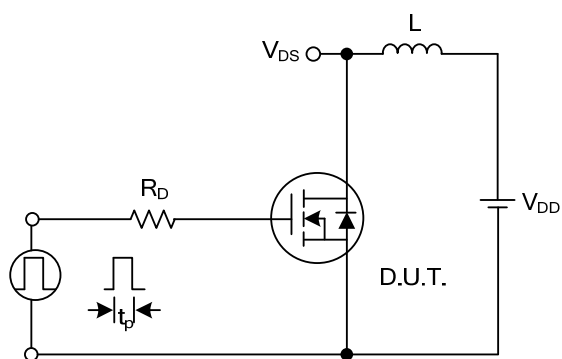
Switching Waveforms



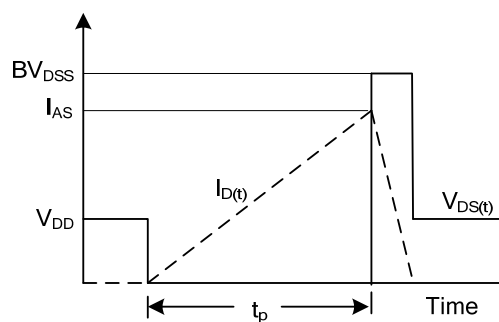
Gate Charge Test Circuit



Gate Charge Waveform

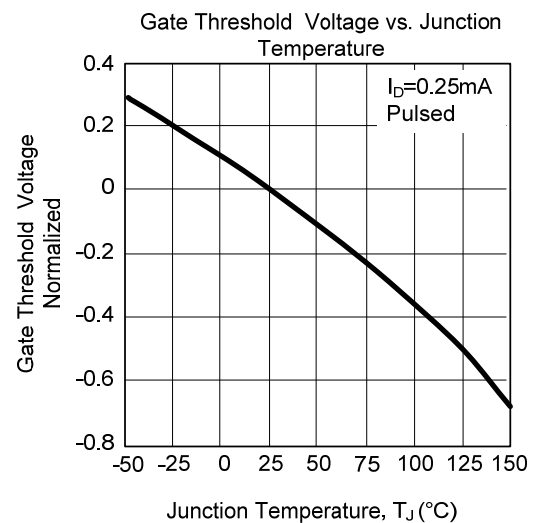
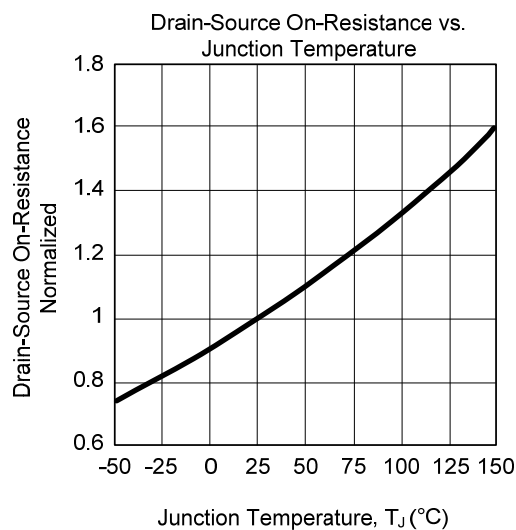
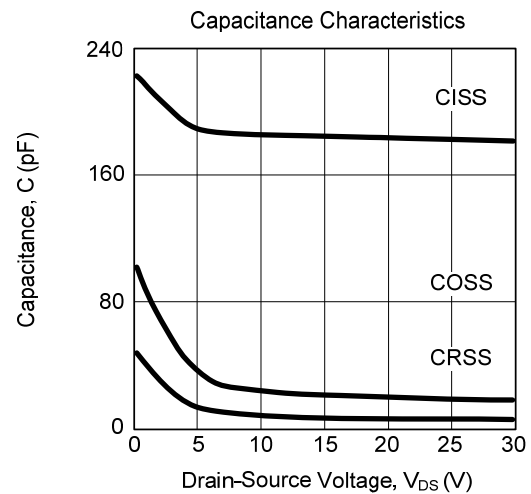
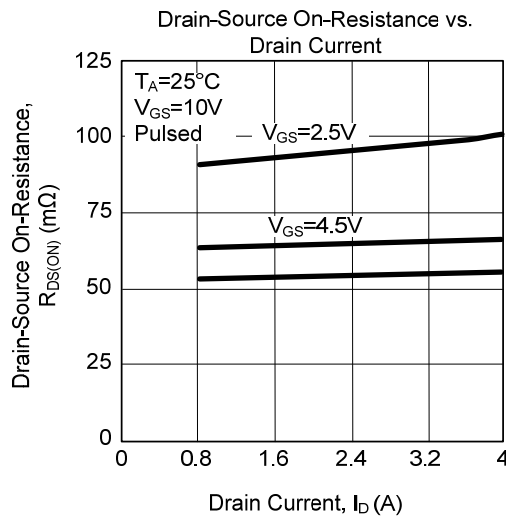
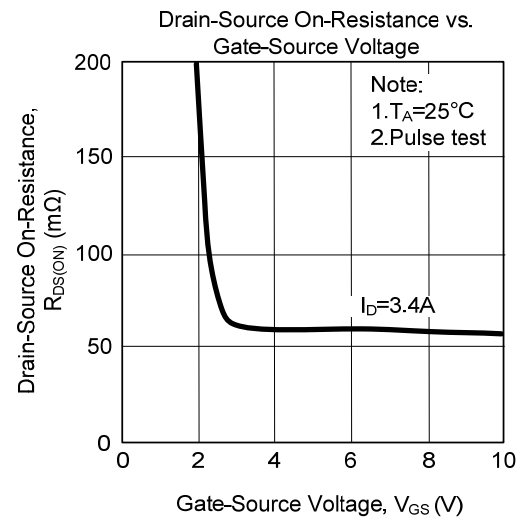
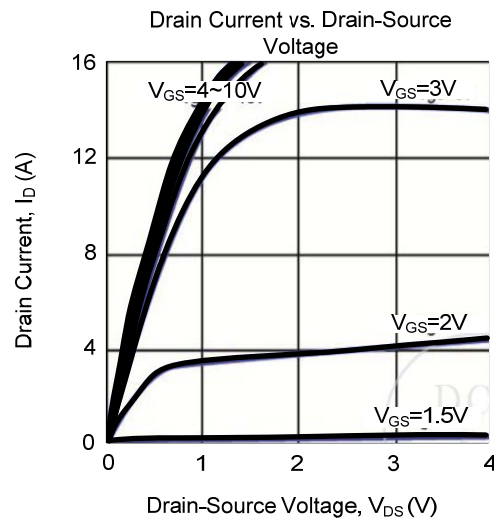


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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