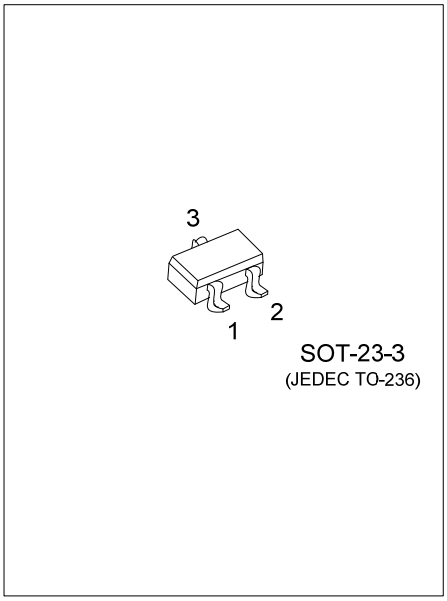
0.1A, 600V N-CHANNEL POWER MOSFET



■ DESCRIPTION

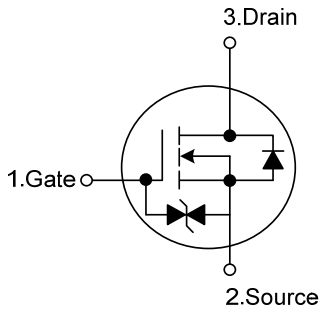
The UTC **01N60Z-ML** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed, low gate charge and low input capacitance.

The UTC **01N60Z-ML** is universally applied in high efficiency switch mode power supply.

■ FEATURES

* $R_{DS(ON)} \leq 60\ \Omega$ @ V_{GS}=10V, I_D=50mA
* High switching speed
* With ESD protection

■ SYMBOL



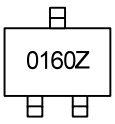
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
01N60ZL-AE2-R	01N60ZG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

01N60ZG-AE2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage (Note 2)		V_{GSS}	±20	V
Drain Current	Continuous	I_D	0.1	A
	Pulsed	I_{DM}	0.3	A
Power Dissipation(Ta=25℃)		P_D	0.5	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	250	°C/W
Junction to Case	θ_{JC}	208	°C/W

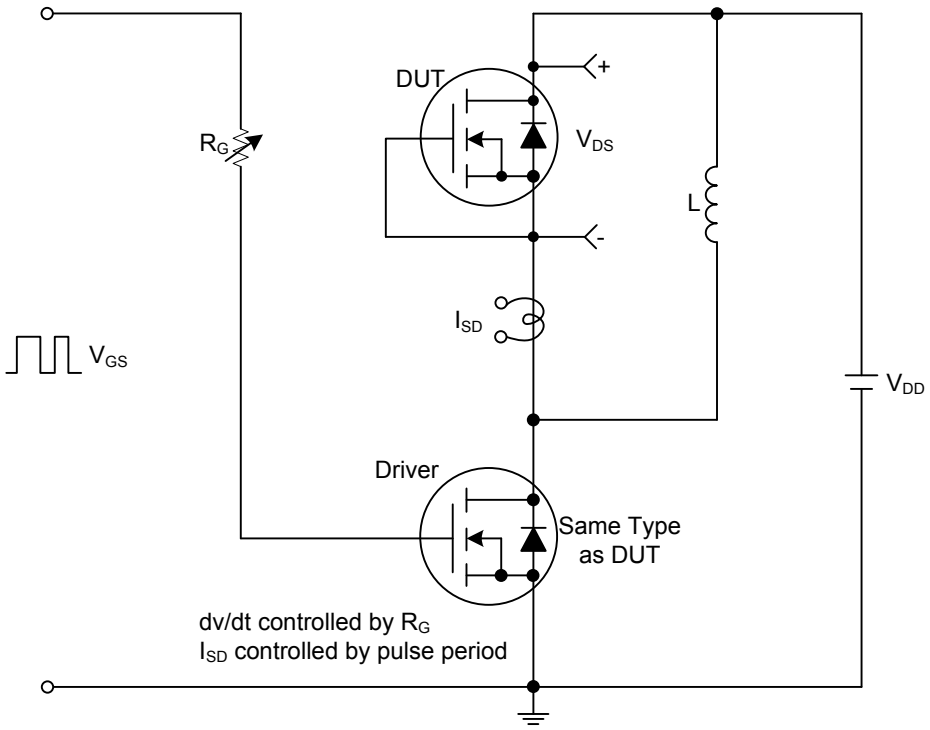
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

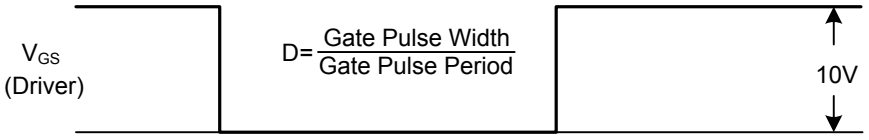
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

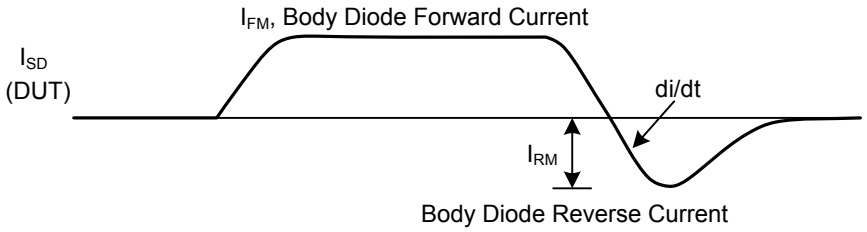
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	600			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=600V			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=20V, V_{DS}=0V			10	uA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-10	uA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=50mA			60	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz (Note 1, 2)		27		pF
Output Capacitance		C_{OSS}			11		pF
Reverse Transfer Capacitance		C_{RSS}			2.9		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=100V, V_{GS}=10V, I_D=0.1A		8.2		nC
Gate-Source Charge		Q_{GS}			2.9		nC
Gate-Drain Charge		Q_{GD}			1		nC
Turn-On Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=100V, V_{GS}=10V, I_D =50mA, R_G =3.3Ω (Note 1, 2)		4.4		ns
Turn-On Rise Time		t_R			18		ns
Turn-Off Delay Time		$t_{D(OFF)}$			20		ns
Turn-Off Fall Time		t_F			320		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				0.1	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				0.3	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=0.1A, V_{GS}=0V			1.4	V

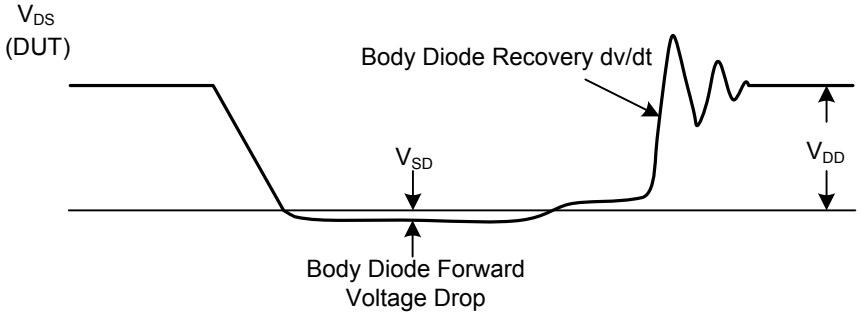
Notes: 1. Pulse Test: Pulse width ≤ 250μs, Duty cycle ≤ 2%
2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS



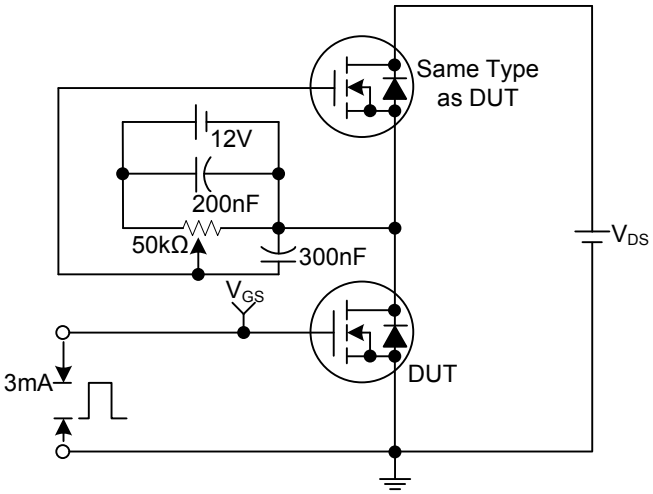




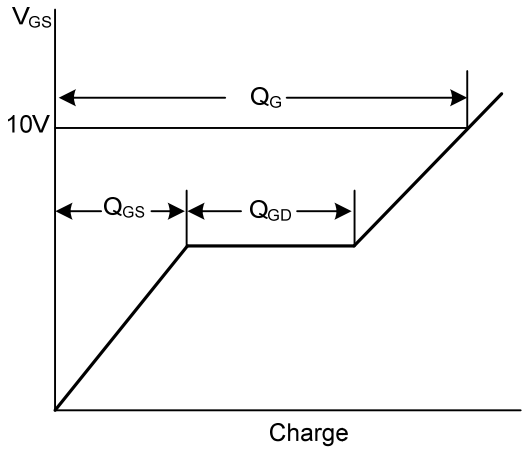


Peak Diode Recovery dv/dt Test Circuit and Waveforms

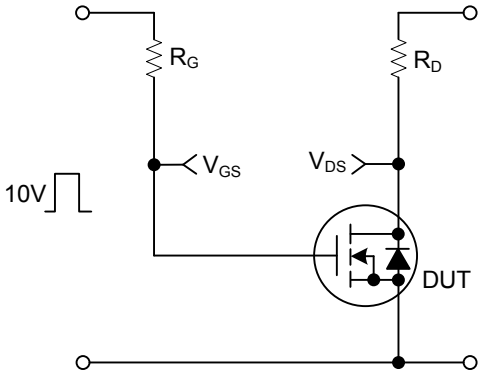
■ TEST CIRCUITS AND WAVEFORMS



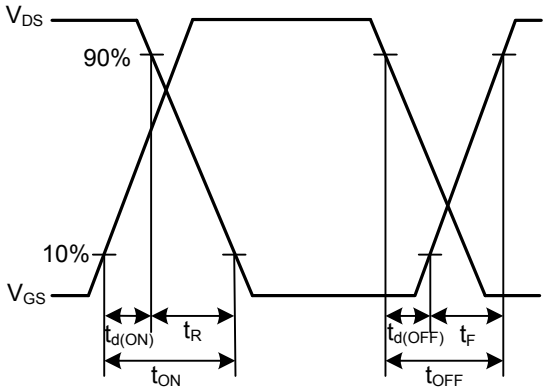
Gate Charge Test Circuit



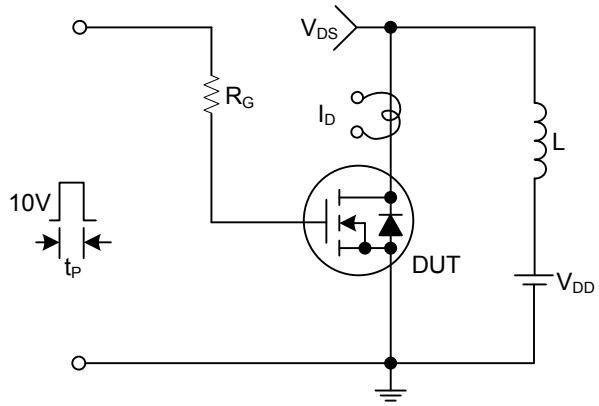
Gate Charge Waveforms



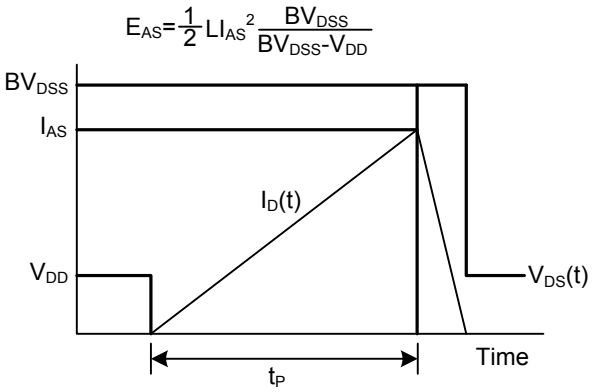
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms