



UT3P06MZ

Preliminary

Power MOSFET

-3.0A, -60V P-CHANNEL POWER MOSFET

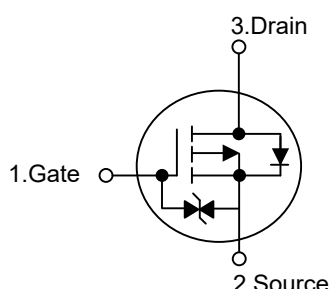
DESCRIPTION

The UTC **UT3P06MZ** is a P-channel enhancement mode power MOSFET with low on-resistance and favorable stabilization. It can be used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- * $R_{DS(ON)} \leq 0.39 \Omega$ @ $V_{GS} = -10V$, $I_D = -1.5A$
- * $R_{DS(ON)} \leq 0.53 \Omega$ @ $V_{GS} = -4.5V$, $I_D = -1.5A$
- * Low on-resistance
- * Low drive current
- * High speed switching
- * With ESD protection

SYMBOL



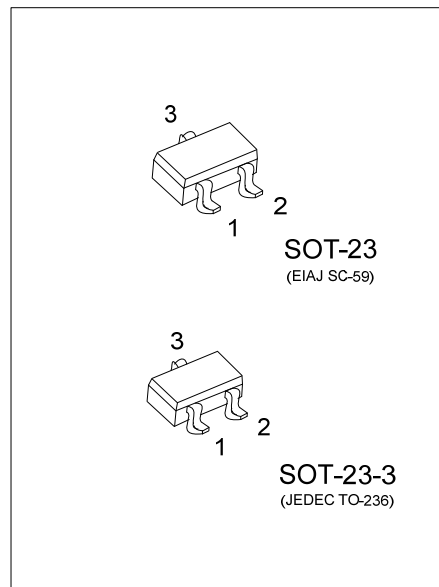
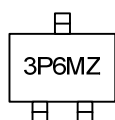
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3P06MZL-AE2-R	UT3P06MZG-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT3P06MZL-AE3-R	UT3P06MZG-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>UT3P06MZG-AE2-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AE2: SOT-23-3, AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	Continuous	I_D	-3	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-6	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	2.42	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.1	V/ns
Power Dissipation	SOT-23	P_D	0.4	W
	SOT-23-3		0.35	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. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = 1\text{mH}$, $I_{AS} = -2.2\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq -3\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23	θ_{JA}	312	$^{\circ}\text{C}/\text{W}$
	SOT-23-3		357	$^{\circ}\text{C}/\text{W}$

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

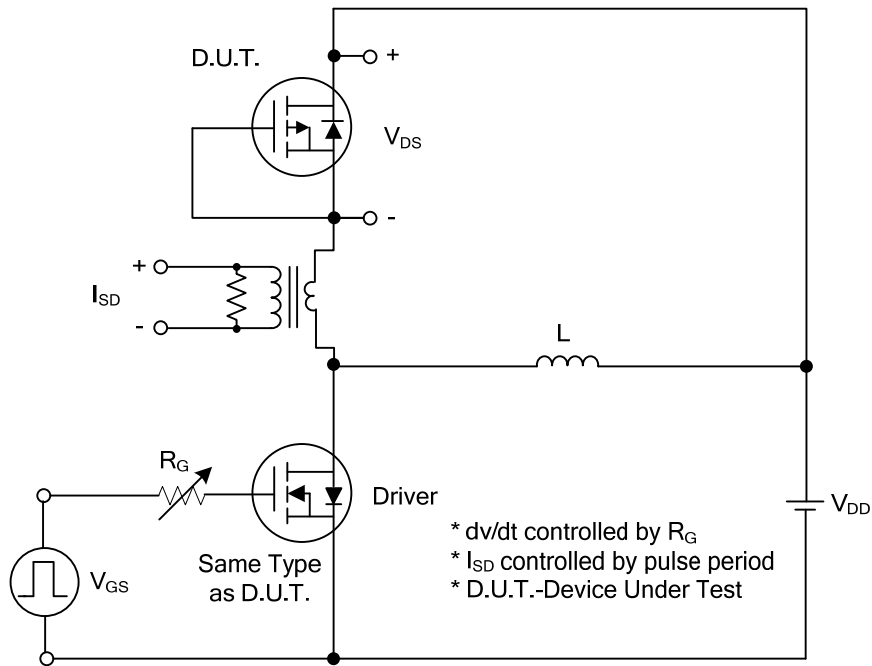
■ ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0 V, I _D =-250μA	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =+20V			10	μA
	Reverse		V _{DS} =0V, V _{GS} =-20V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0		-3.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-1.5A			0.39	Ω
			V _{GS} =-4.5V, I _D =-1.5A			0.53	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz		118		nF
Output Capacitance		C _{OSS}			22		nF
Reverse Transfer Capacitance		C _{RSS}			12		nF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-3.0A (Note 1, 2)		9		nC
Gate to Source Charge		Q _{GS}			2		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =-30V, V _{GS} =-10V, I _D =-3.0A, R _G =3Ω (Note 1, 2)		25		ns
Rise Time		t _R			35		ns
Turn-OFF Delay Time		t _{D(OFF)}			277		ns
Fall-Time		t _F			147		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-3	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				-6	A
Diode Forward Voltage		V _{SD}	I _S =-3.0A, V _{GS} =0V			-1.2	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =-3.0A, V _{GS} =0V,		147		nS
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		272		nC

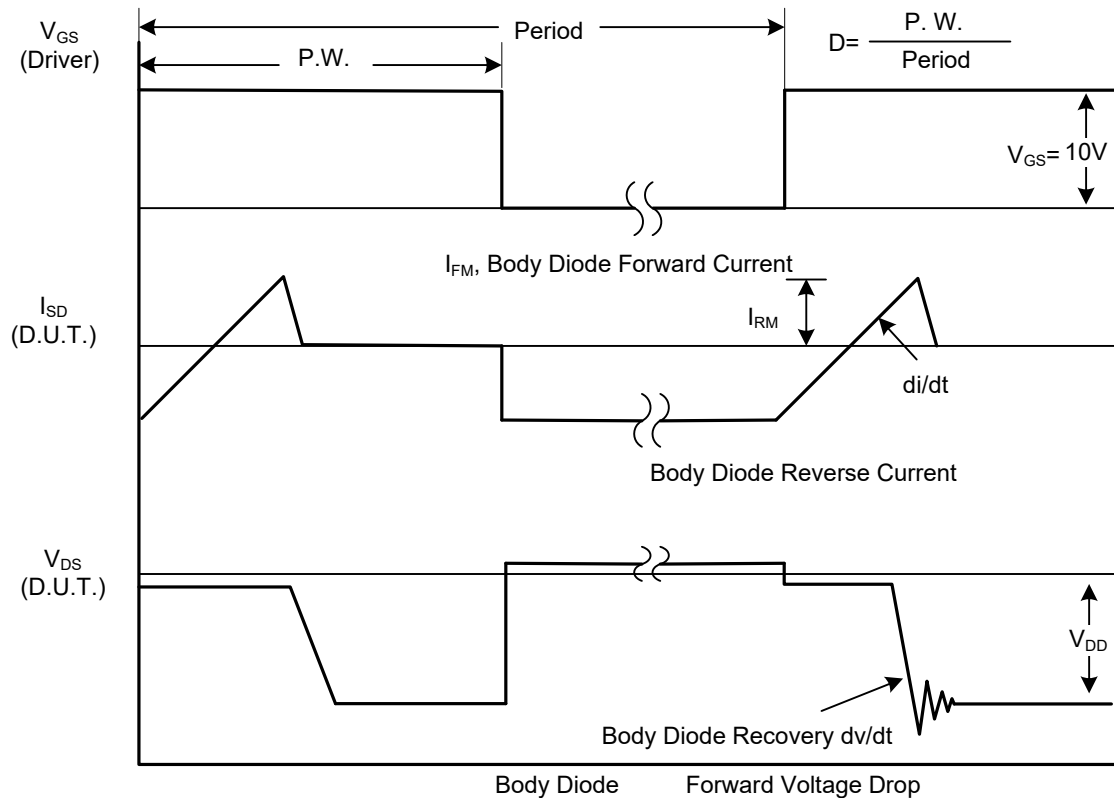
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

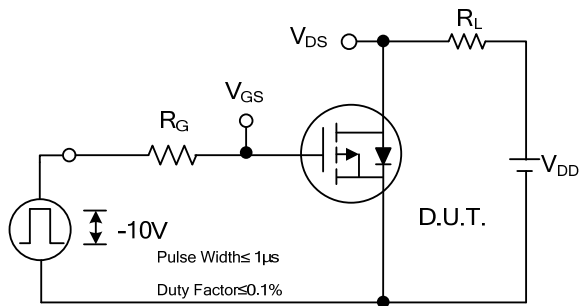


Peak Diode Recovery dv/dt Test Circuit

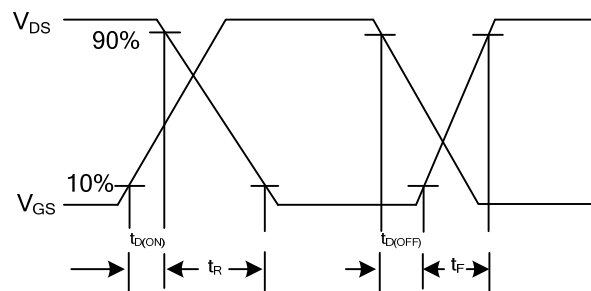


Peak Diode Recovery dv/dt Waveforms

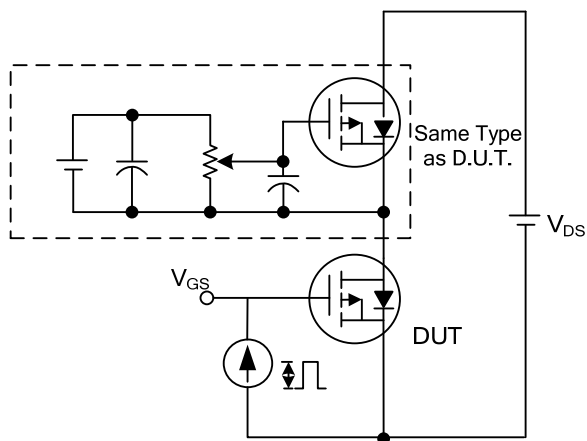
TEST CIRCUITS AND WAVEFORMS



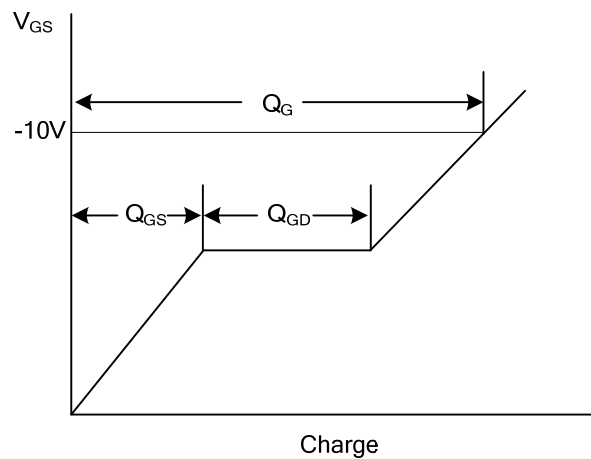
Switching Test Circuit



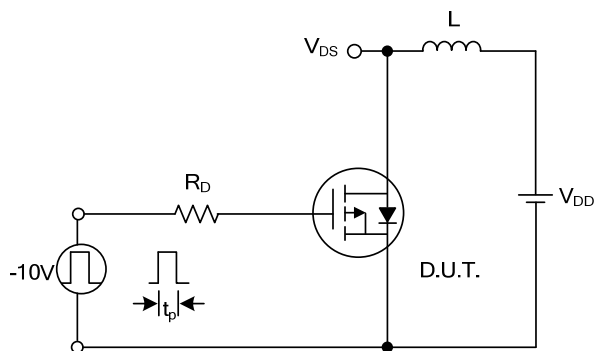
Switching Waveforms



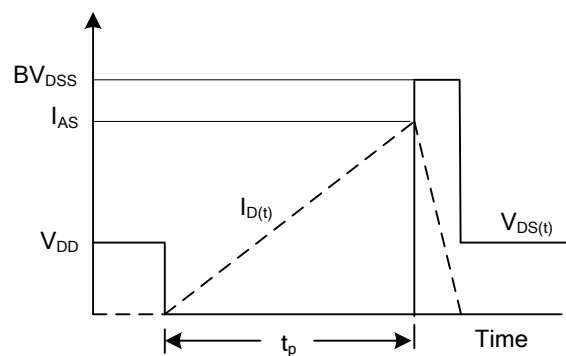
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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