



UT30P06Z

Preliminary

Power MOSFET

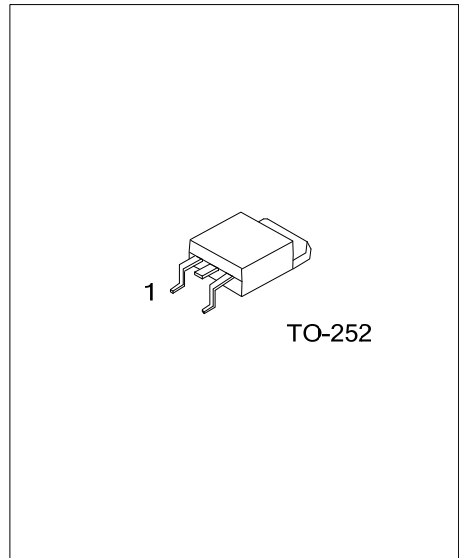
**-60V, -30A P-CHANNEL
POWER MOSFET**

■ DESCRIPTION

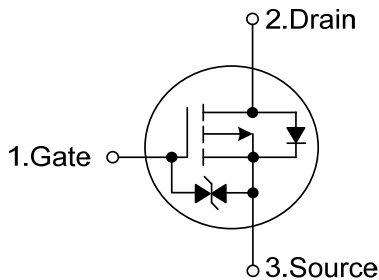
The UTC **UT30P06Z** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and a minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

- * $R_{DS(ON)} \leq 58 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$
- * $R_{DS(ON)} \leq 92 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -15\text{A}$
- * High Switching Speed
- * With ESD Protected



■ SYMBOL



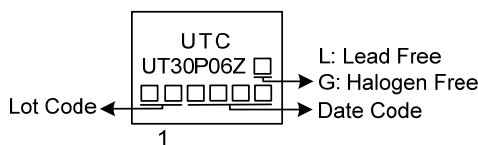
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT30P06ZL-TN3-R	UT30P06ZG-TN3-R	TO-252	G	D	S	Tape Reel

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

	<p>(1) Packing Type (1) R: Tape Reel</p> <p>(2) Package Type (2) TN3: TO-252</p> <p>(3) Green Package (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_{DSS}	-60	V
Gate-Source Voltage			V_{GSS}	± 20	V
Drain Current	Continuous, $V_{GSS}@-10\text{V}$	$T_C=25^\circ\text{C}$	I_D	-30	A
	Pulsed (Note 2)		I_{DM}	-60	A
Avalanche Energy	Repetitive (Note 3)		E_{AS}	25.5	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	3.1	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)			P_D	44	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. $L = 0.1\text{mH}$, $I_{AS} = -22.6\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J=25^\circ\text{C}$.

4. $I_{SD} \leq -30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	110	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.84 (Note)	$^\circ\text{C}/\text{W}$

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

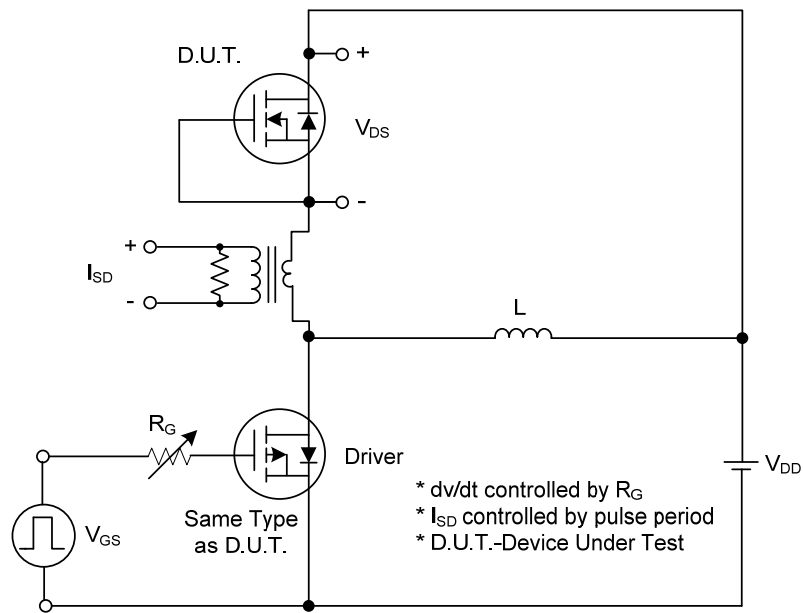
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V,			-1	μA
Gate- Source Leakage Current	Forward	I _{GSS}			+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	-1.0		-3.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-15A			58	mΩ
		V _{GS} =-4.5V, I _D =-15A			92	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1.0MHz		1911		pF
Output Capacitance	C _{OSS}			131		pF
Reverse Transfer Capacitance	C _{RSS}			100		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-30A (Note 1, 2)		48		nC
Gate-Source Charge	Q _{GS}			8		nC
Gate-Drain Charge	Q _{GD}			16		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-30V, V _{GS} =-10V, I _D =-30A, R _G =3Ω (Note 1, 2)		16		ns
Rise Time	t _R			26		ns
Turn-OFF Delay Time	t _{D(OFF)}			257		ns
Fall-Time	t _F			87		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				-30	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =-30A, V _{GS} =0V (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =-30A, V _{GS} =0V, dI _F /dt=100A/μs		62		ns
Body Diode Reverse Recovery Charge	Q _{rr}			72		nC

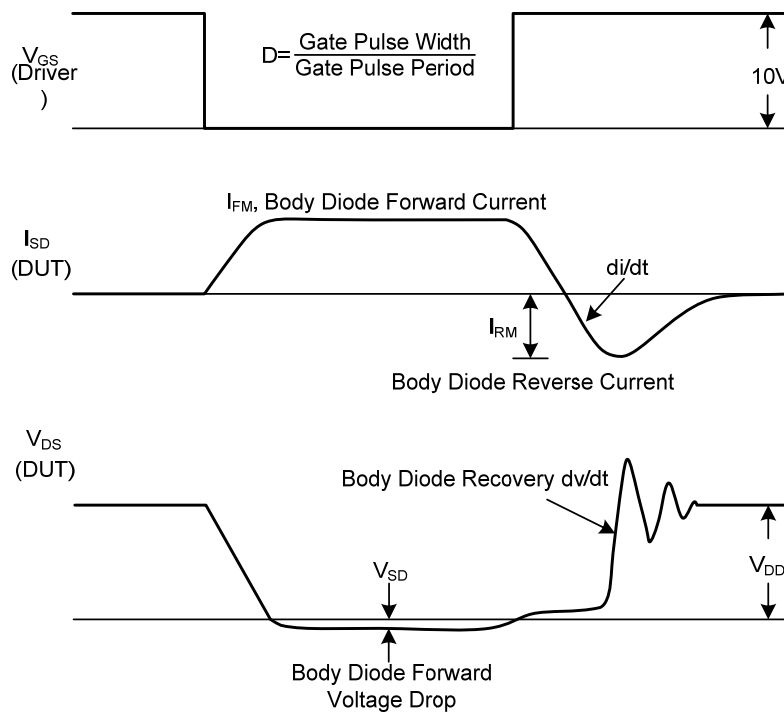
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

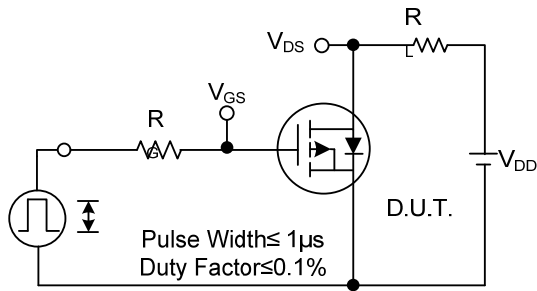


Peak Diode Recovery dv/dt Test Circuit

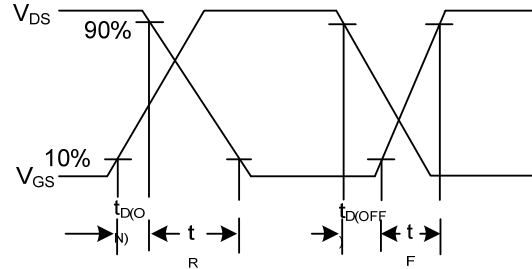


Peak Diode Recovery dv/dt Waveforms

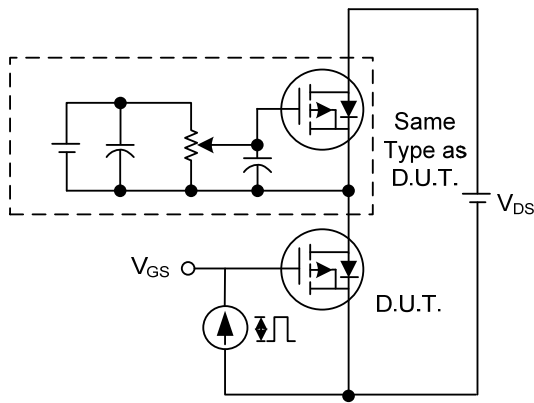
■ TEST CIRCUITS AND WAVEFORMS



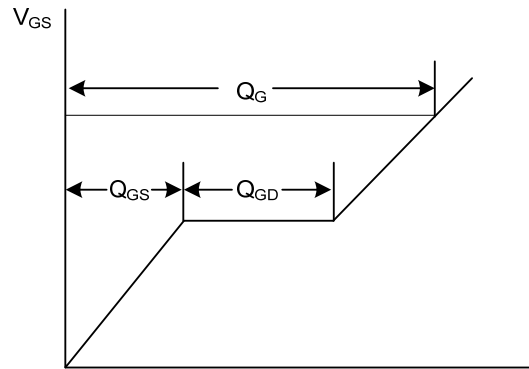
Switching Test Circuit



Switching Waveforms

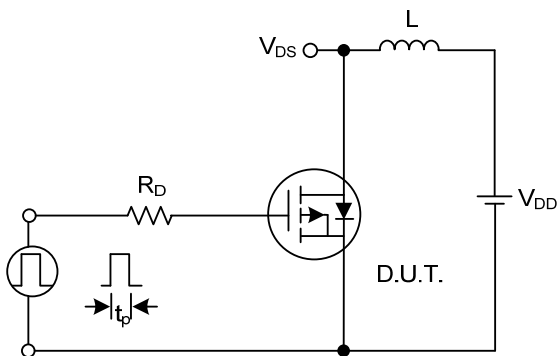


Gate Charge Test Circuit

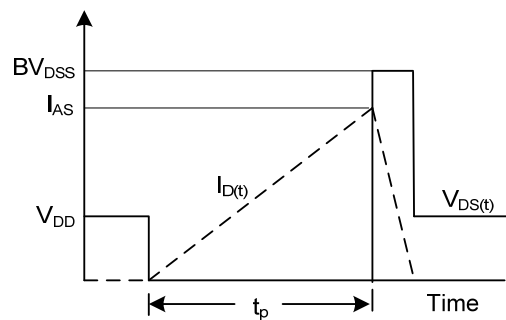


Charge

Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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