

**UT7422Z**

Preliminary

Power MOSFET

**40A, 30V N-CHANNEL
MOSFET ESD PROTECTION****DESCRIPTION**

The UTC **UT7422Z** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, etc.

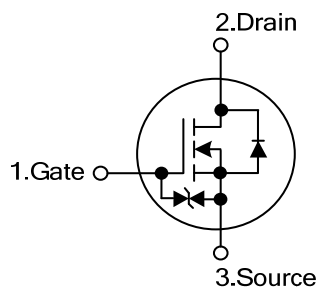
The UTC **UT7422Z** is suitable for load switch and battery protection applications.

FEATURES

* $R_{DS(ON)} \leq 4.3 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=20\text{A}$

$R_{DS(ON)} \leq 6.0 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=16\text{A}$

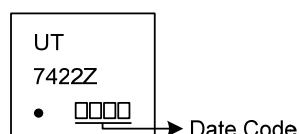
* Low $R_{DS(ON)}$

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7422ZL-K08-3030-R	UT7422ZG-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT7422ZG-K08-3030-R (1) Packing Type (2) Package Type (3) Green Package		(1) R: Tape Reel (2) K08-3030: DFN3030-8 (3) G: Halogen Free and Lead Free, K: Lead Free
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MARKING

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $T_C=25^\circ\text{C}$	I_D	40	A
Pulsed Drain Current (Note 2)	I_{DM}	200	A
Continuous Drain Current $T_A=25^\circ\text{C}$	I_{DSM}	20	A
Avalanche Current (Note 2)	I_{AS}	45	A
Avalanche Energy $L=0.1\text{mH}$ (Note 2)	E_{AS}	101	mJ
Power Dissipation $T_C=25^\circ\text{C}$	P_D	36	W
Junction Temperature	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

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 junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.

■ **THERMAL DATA**

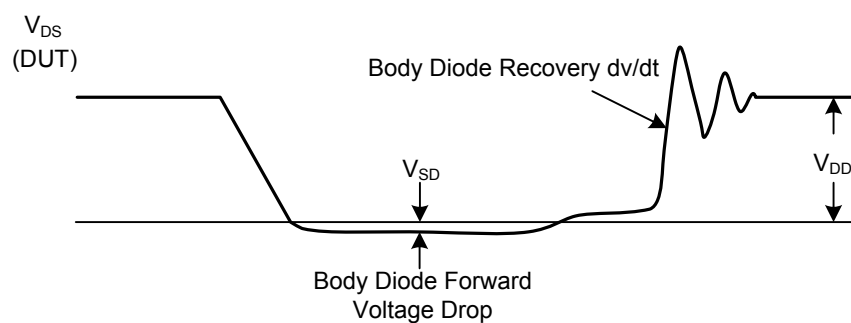
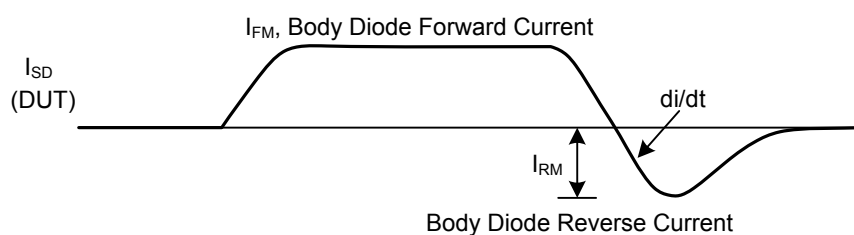
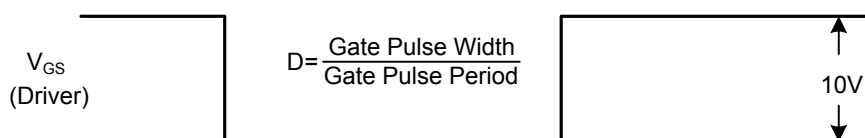
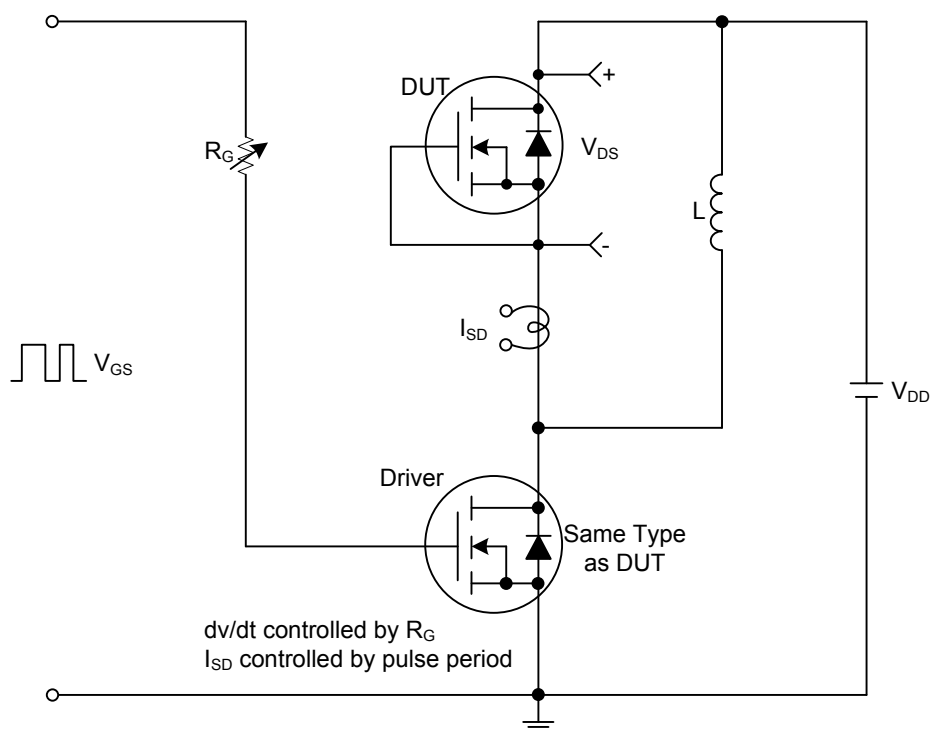
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	$^\circ\text{C/W}$
Junction to Case	θ_{JC}	3.4	$^\circ\text{C/W}$

■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
		V _{DS} =30V, V _{GS} =0V, T _J =55°C			5	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.3	1.85	2.4	V
On State Drain Current	I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	200			A
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		3.5	4.3	mΩ
		V _{GS} =10V, I _D =20A, T _J =125°C		5.5	6.8	mΩ
		V _{GS} =4.5V, I _D =16A		4.5	6	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A		85		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz	1950	2445	2940	pF
Output Capacitance	C _{OSS}		270	390	510	pF
Reverse Transfer Capacitance	C _{RSS}		130	220	310	pF
Gate Resistance	R _G	V _{DS} =0V, V _{GS} =0V, f=1.0MHz	1.2	2.4	3.6	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =15V, I _D =20A	32	41	50	nC
Total Gate Charge	Q _G	V _{GS} =4.5V, V _{DS} =15V, I _D =20A	15	19	24	nC
Gate to Source Charge	Q _{GS}			7.2		nC
Gate to Drain Charge	Q _{GD}			6.6		nC
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω		7		ns
Rise Time	t _R			5		ns
Turn-OFF Delay Time	t _{D(OFF)}			41.5		ns
Fall-Time	t _F			10.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.7	1	V
Maximum Body-Diode Continuous Current (Note)	I _S				40	A
Body Diode Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=500A/μs		17.5	22	ns
Body Diode Reverse Recovery Charge	Q _{rr}			31	40	nC

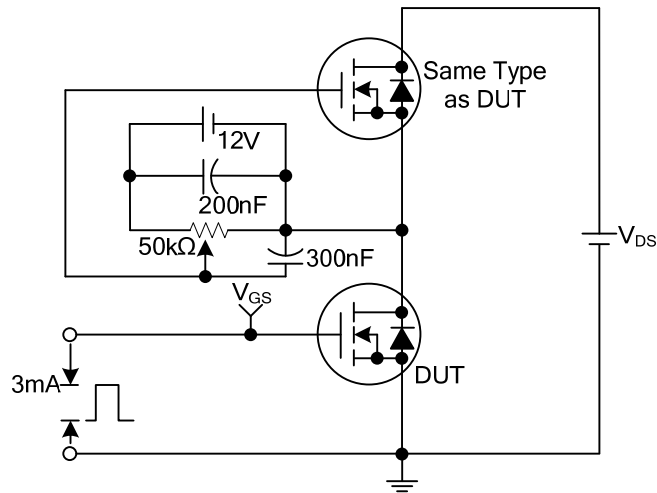
Note: The maximum current rating is package limited.

■ TEST CIRCUITS AND WAVEFORMS

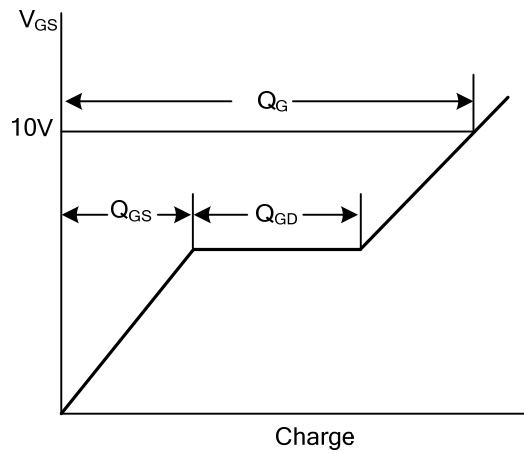


Peak Diode Recovery dv/dt Test Circuit and Waveforms

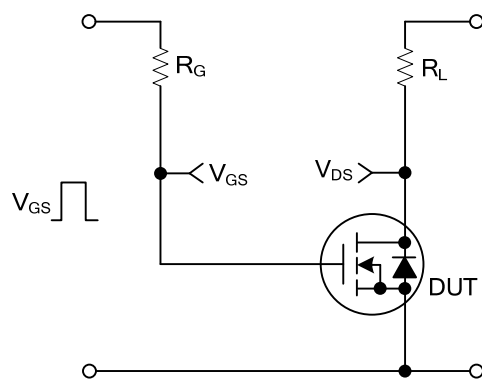
■ TEST CIRCUITS AND WAVEFORMS



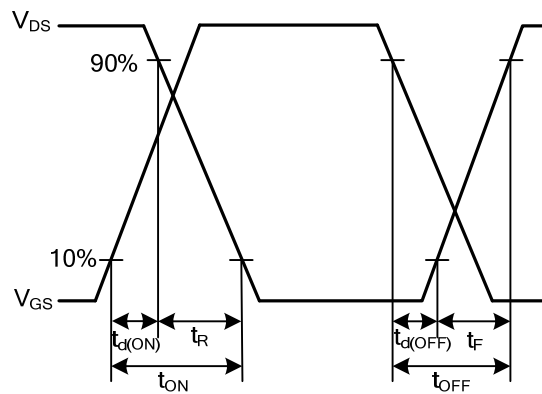
Gate Charge Test Circuit



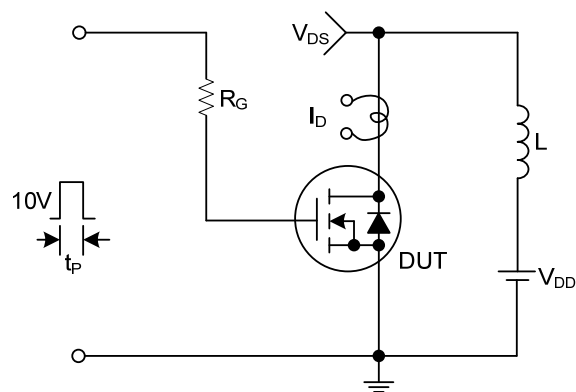
Gate Charge Waveforms



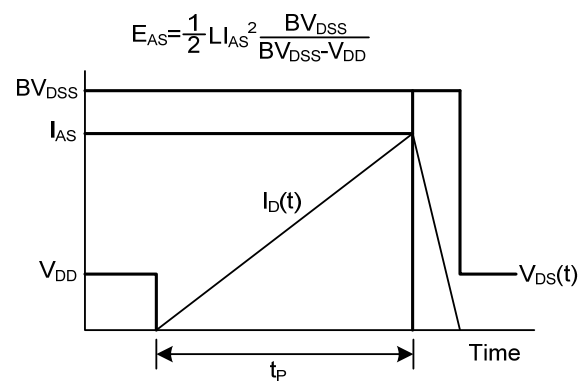
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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