



5N25Z-Q

Preliminary

Power MOSFET

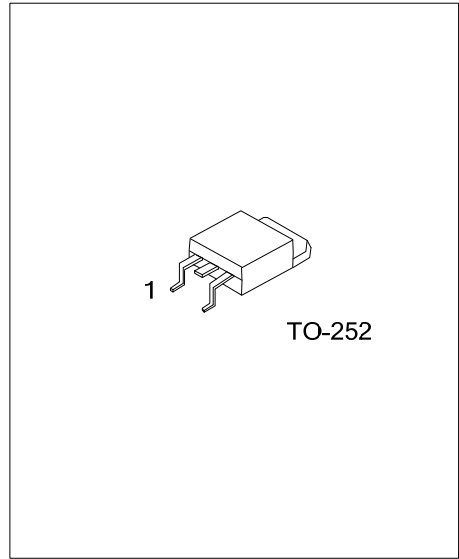
5A, 250V N-CHANNEL POWER MOSFET

DESCRIPTION

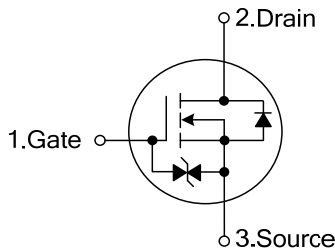
The UTC **5N25Z-Q** is a N-channel enhancement mode Power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and superior switching performance.

FEATURES

- * $R_{DS(ON)} < 2.0\Omega$ @ $V_{GS}=10V, I_D=2.5A$
- * High switching speed
- * Typically 12.5nC low gate charge
- * 100% avalanche tested



SYMBOL



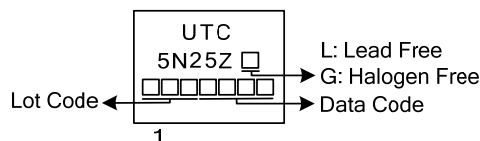
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
5N25ZL-TN3-R	5N25ZG-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>5N25ZG-TN3-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) TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS

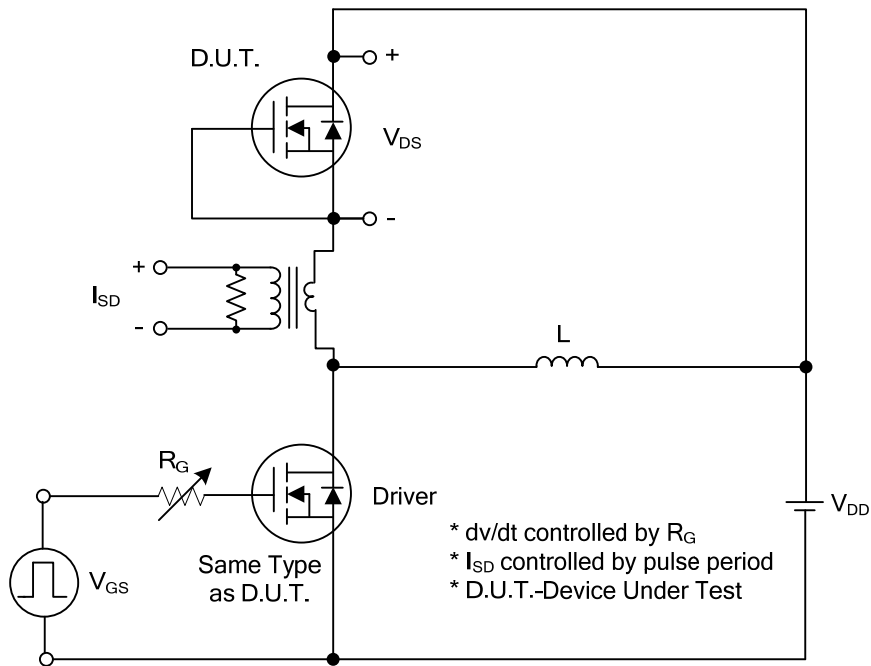
PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Continuous	I_D	5	A
	Pulsed	I_{DM}	20	A
Avalanche Energy		E_{AS}	52	mJ
Power Dissipation	SOT-223	P_D	0.8	W
	TO-251/TO-252		1.14	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55~+150	$^{\circ}\text{C}$

Note: 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.

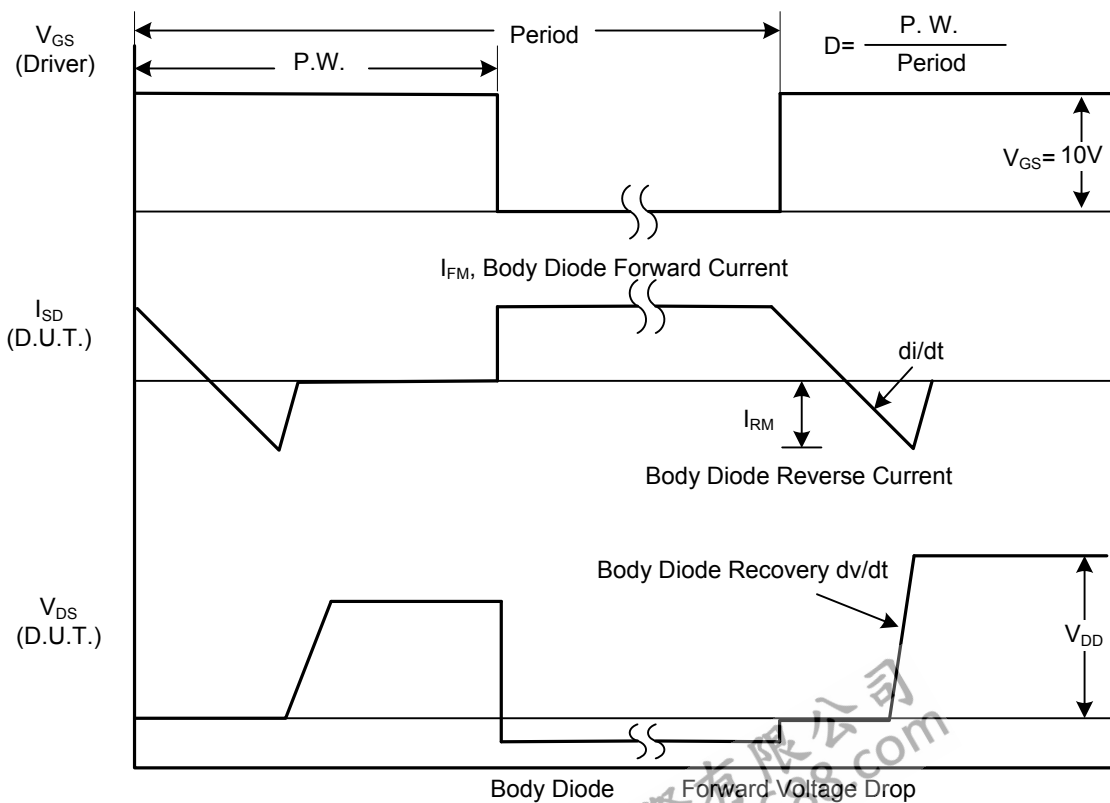
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	250			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=250\text{V}$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20\text{V}, V_{DS}=0\text{V}$			10	μA
	Reverse		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=2.5\text{A}$			2.0	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1\text{MHz}$		190		pF
Output Capacitance		C_{OSS}			30		pF
Reverse Transfer Capacitance		C_{RSS}			8		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{DD}=50\text{V}, I_D=1.3\text{A}, I_G=100\mu\text{A}, V_{GS}=10\text{V}$		12.5	15	nC
Gate to Source Charge		Q_{GS}			2.16		nC
Gate to Drain Charge		Q_{GD}			2.56		nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=30\text{V}, I_D=0.5\text{A}, R_G=25\Omega, V_{GS}=0\sim 10\text{V}$		36	43	ns
Rise Time		t_R			34	41	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			80	96	ns
Fall-Time		t_F			26	31	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				5	A
Maximum Body-Diode Pulsed Current		I_{SM}				20	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=5.0\text{A}$			1.3	V

■ TEST CIRCUITS AND WAVEFORMS

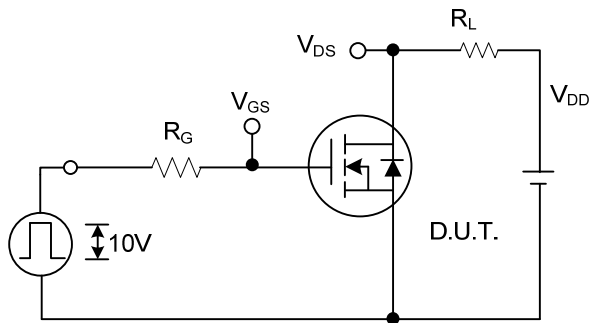


Peak Diode Recovery dv/dt Test Circuit

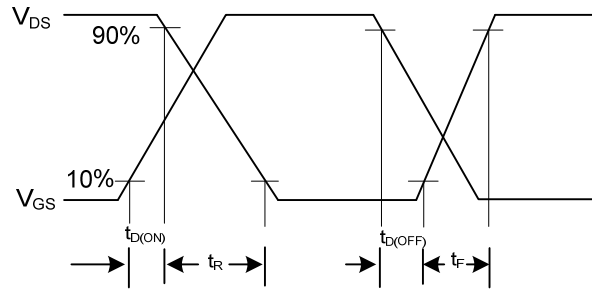


Peak Diode Recovery dv/dt Waveforms

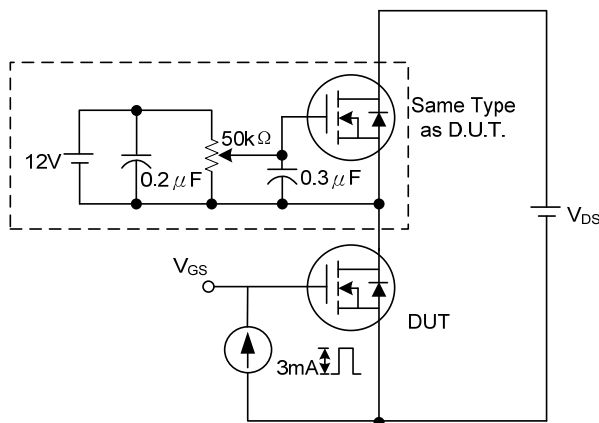
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



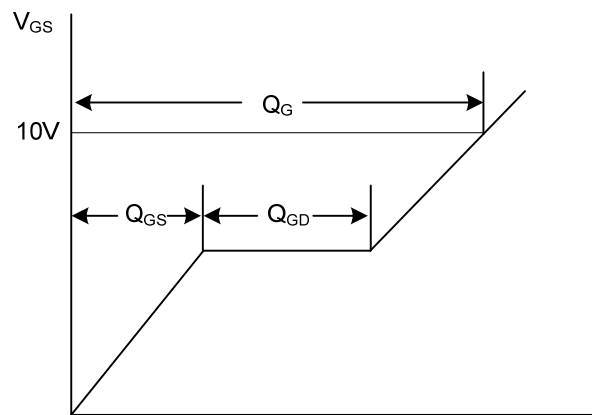
Switching Test Circuit



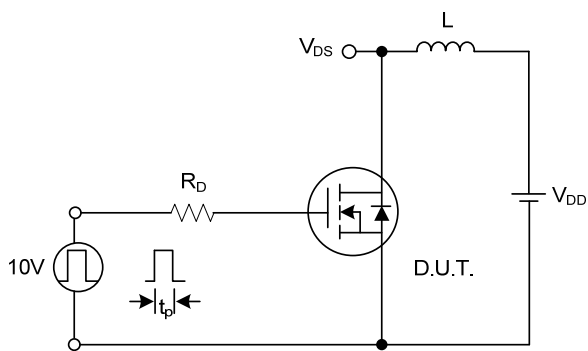
Switching Waveforms



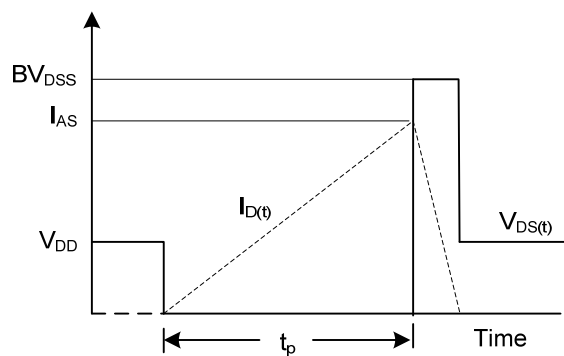
Gate Charge Test Circuit



Charge Gate Charge Waveform

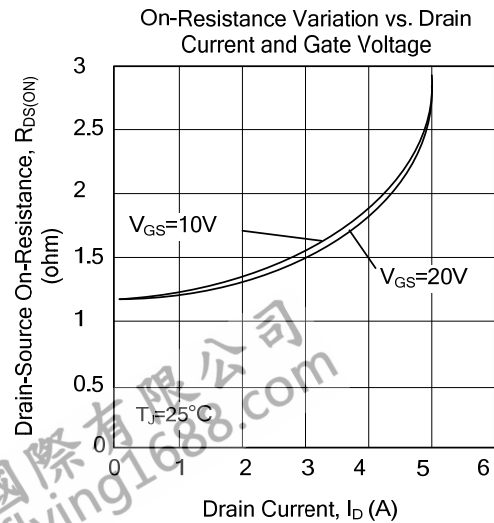
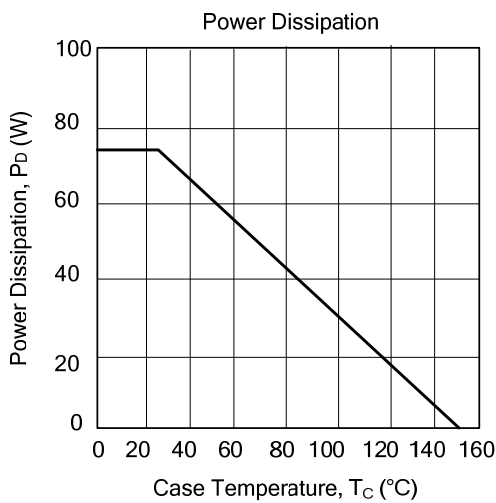
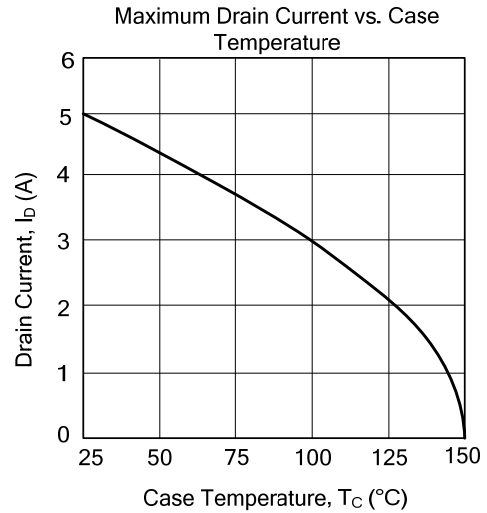
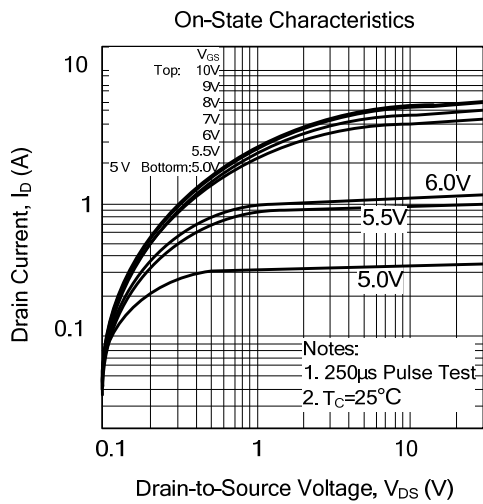
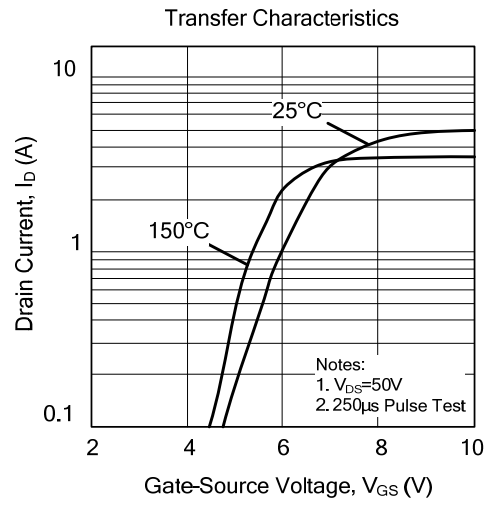
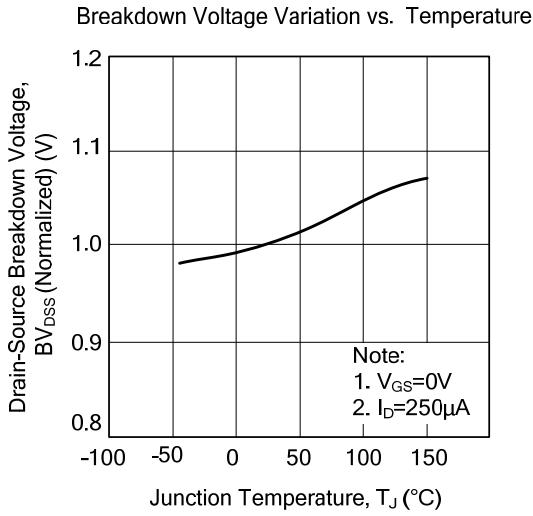


Unclamped Inductive Switching Test Circuit

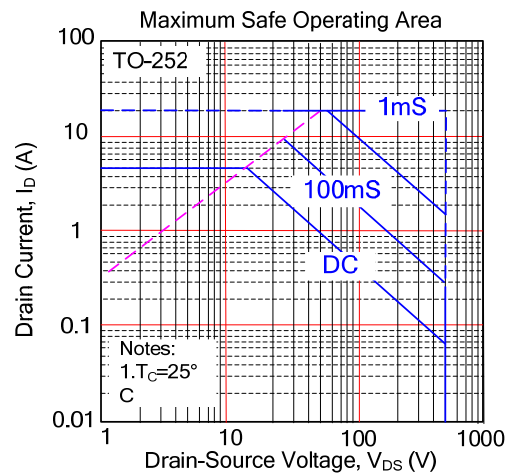
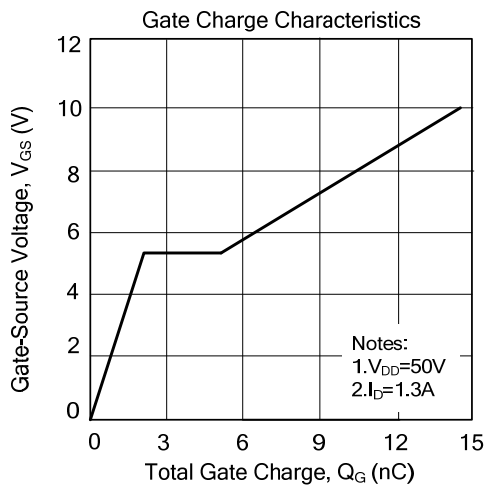
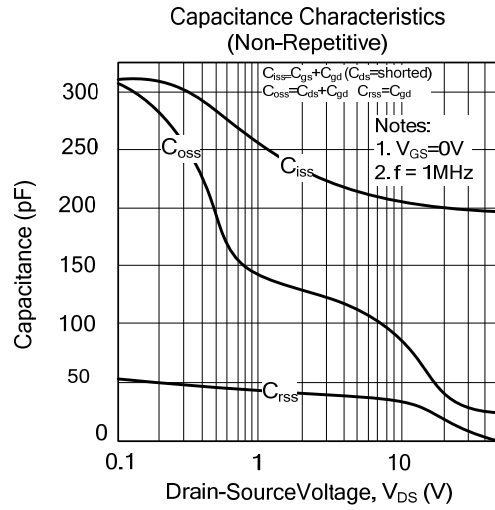
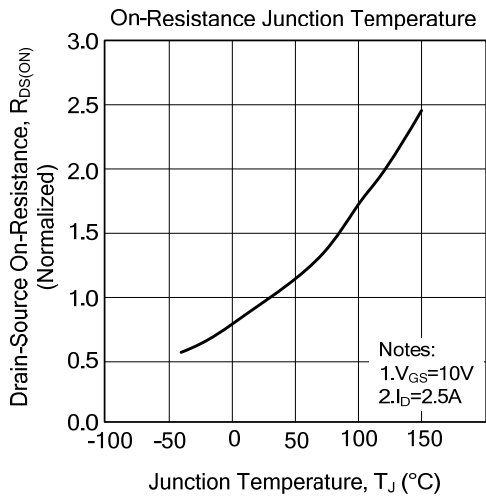


Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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