

**USG10R800MZM1**

Preliminary

Power MOSFET

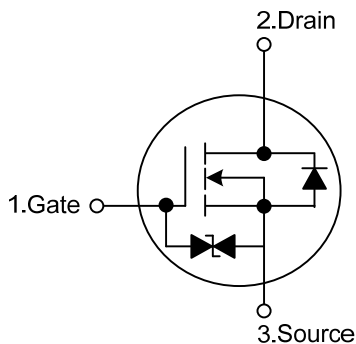
**N-CHANNEL SGT
ENHANCEMENT POWER
MOSFET****DESCRIPTION**

The UTC **USG10R800MZM1** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **USG10R800MZM1** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

FEATURES

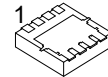
- * $R_{DS(ON)} \leq 80 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=4.0\text{A}$
 $R_{DS(ON)} \leq 115 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=2.0\text{A}$
- * MSL1 Robust Package Design
- * High Cell Density Trench Technology
- * High Power and Current Handling Capability
- * Green & Pb-Free

SYMBOL**ORDERING INFORMATION**

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
USG10R800MZM1-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

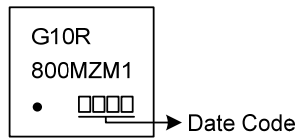
Note: Pin Assignment: S: Source G: Gate D: Drain

USG10R800MZM1-P3030-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) P3030: PDFN3×3



PDFN3×3

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	100	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	8	A
	Pulsed (Note 2)	I _{DM}	16	A
Single Pulsed Avalanche Energy (Note 3)		E _{AS}	0.11	mJ
Power Dissipation		P _D	6.7	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.

3. L = 0.1mH, I_{AS} = 1.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	130	°C/W
Junction to Case	θ _{JC}	18	°C/W

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

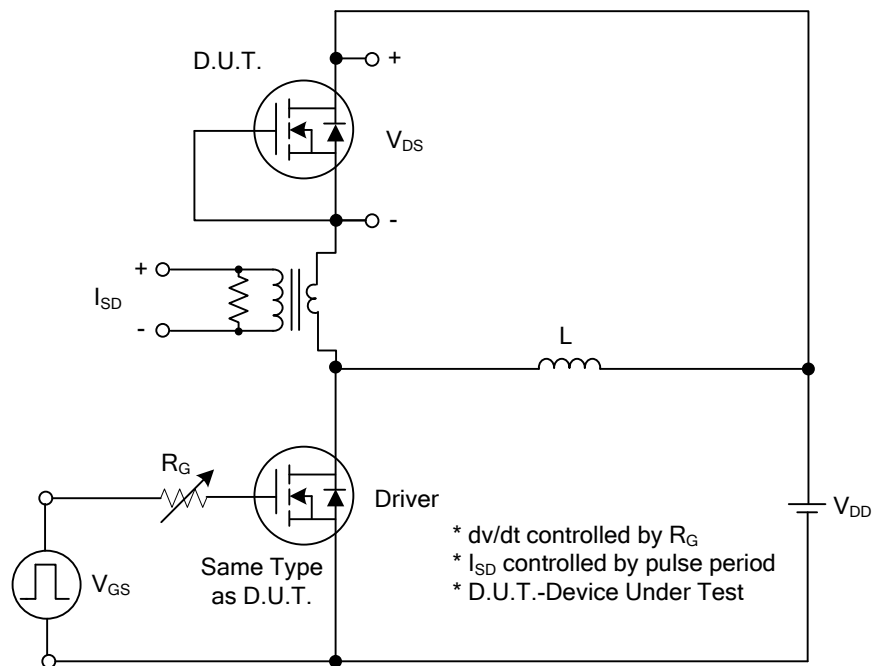
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+10	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =4.0A			80	mΩ
			V _{GS} =4.5V, I _D =2.0A			115	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		294		pF
Output Capacitance		C _{OSS}			125		pF
Reverse Transfer Capacitance		C _{RSS}			24		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =80V, V _{GS} =10V, I _D =6.0A		17.4		nC
Gate to Source Charge		Q _{GS}			5		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =50V, V _{GS} =10V, I _D =12A, R _G =3Ω		7		ns
Rise Time		t _R			17		ns
Turn-OFF Delay Time		t _{D(OFF)}			17		ns
Fall-Time		t _F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				8	A
Maximum Body-Diode Pulsed Current		I _{SM}				16	A
Drain-Source Diode Forward Voltage		V _{SD}	I _{SD} =12A			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =12A, dI/dt=100A/μs		23		ns
Body Diode Reverse Recovery Charge		Q _{rr}			58		nC

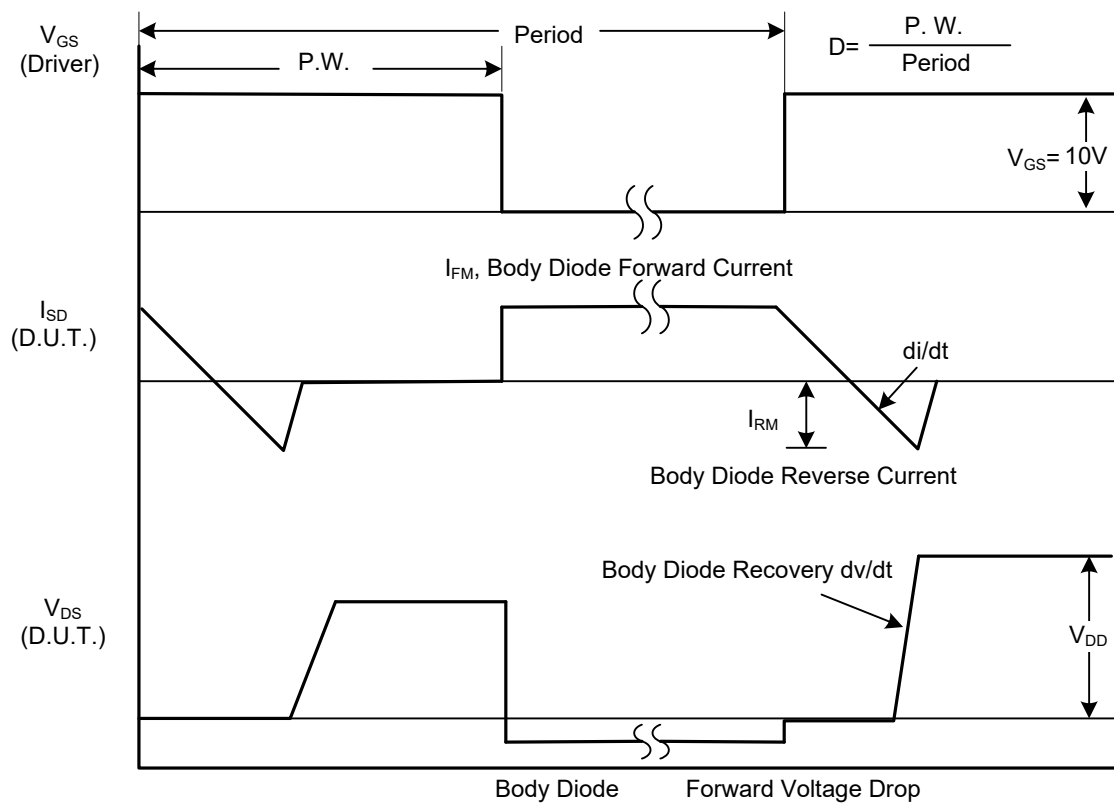
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

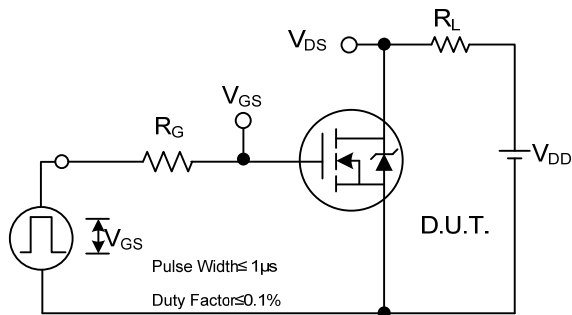


Peak Diode Recovery dv/dt Test Circuit

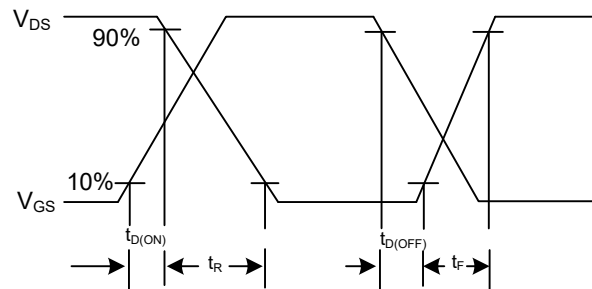


Peak Diode Recovery dv/dt Waveforms

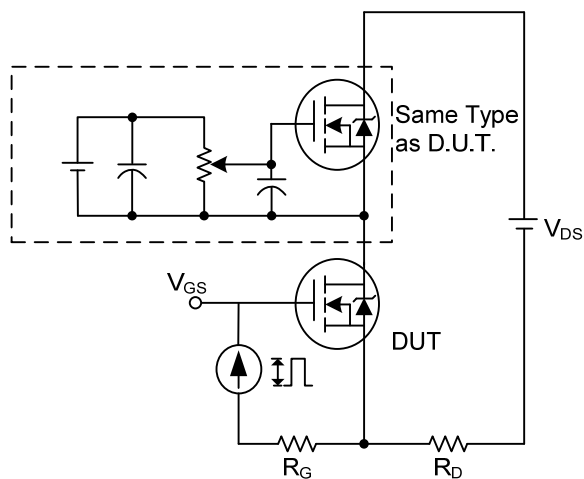
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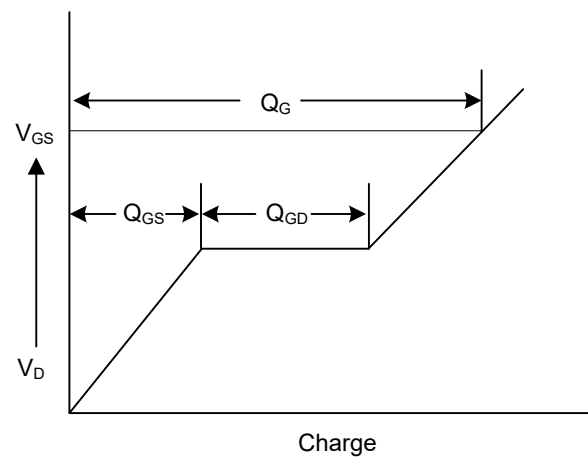
Switching Test Circuit



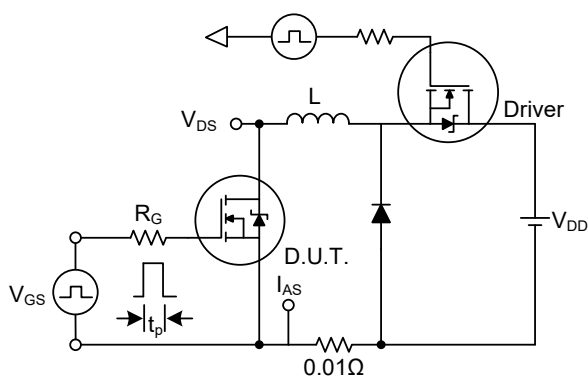
Switching Waveforms



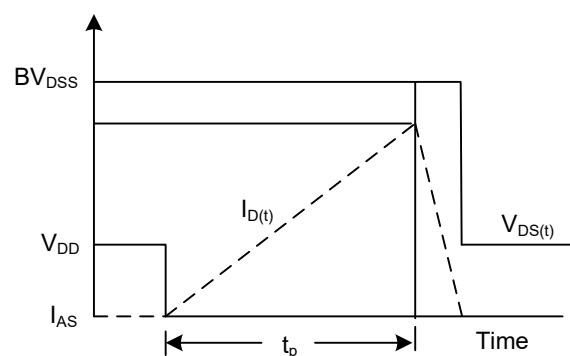
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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