

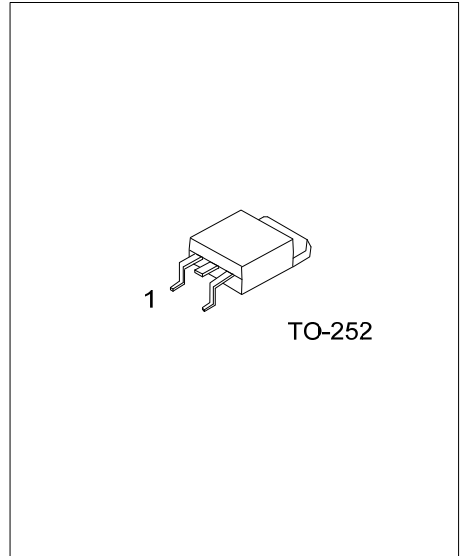


USG06R360M

Preliminary

Power MOSFET

**N-CHANNEL SGT
ENHANCEMENT POWER
MOSFET**



■ DESCRIPTION

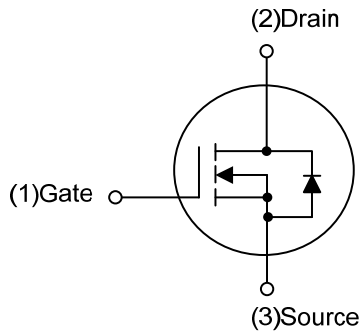
The UTC **USG06R360M** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **USG06R360M** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

■ FEATURES

- * $R_{DS(ON)} \leq 36 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=17\text{A}$
- $R_{DS(ON)} \leq 53 \text{ m}\Omega @ V_{GS}=4.5\text{V}, I_D=12\text{A}$
- * High Cell Density Trench Technology
- * High Power and Current Handling Capability

■ SYMBOL



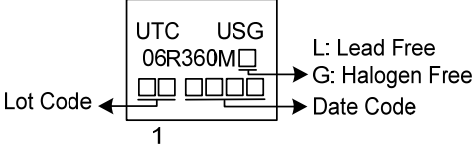
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USG06R360ML-TN3-R	USG06R360MG-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>USG06R360MG-TN3-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
---	--

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	I_D	18	A
	Pulsed (Note 2)	I_{DM}	36	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	0.5	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.9	V/ns
Power Dissipation		P_D	32	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. $L = 0.1\text{mH}$, $I_{AS} = 3.2\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J \leq T_{JMAX}$, $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	110	$^\circ\text{C}/\text{W}$
Junction to Case (Note)		θ_{JC}	3.9 (Note)	$^\circ\text{C}/\text{W}$

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

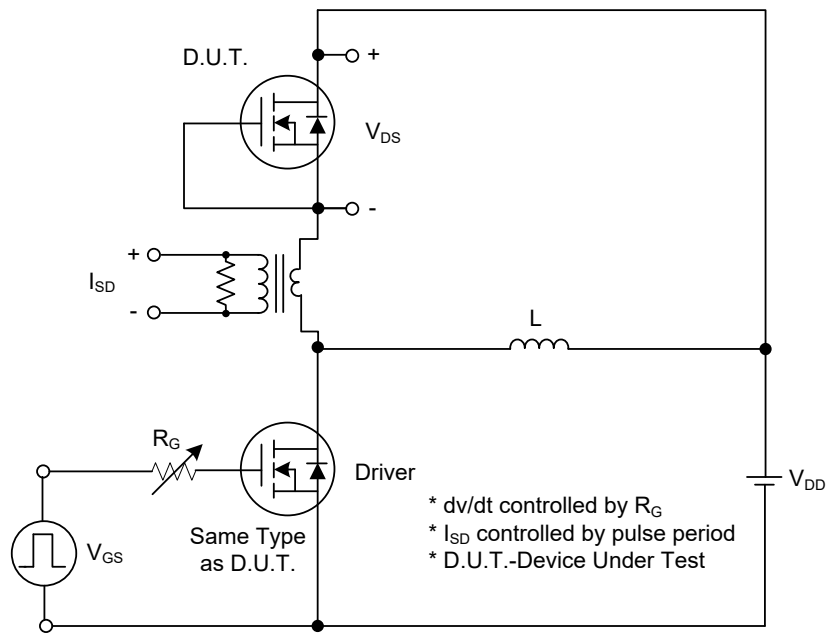
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	60			V	
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$			1	μA	
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA	
	Reverse		$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0		2.5	V	
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=17\text{A}$			36	$\text{m}\Omega$	
			$V_{GS}=4.5\text{V}$, $I_D=12\text{A}$			53	$\text{m}\Omega$	
DYNAMIC PARAMETERS								
Input Capacitance		C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		404		pF	
Output Capacitance		C_{OSS}				124		pF
Reverse Transfer Capacitance		C_{RSS}				20		pF
SWITCHING PARAMETERS								
Total Gate Charge	Q_G	Q_G	$V_{DS}=48\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=18\text{A}$		9.7		nC	
	Q_{GS}				17		nC	
Gate to Source Charge	Q_{GS}	Q_{GD}	$V_{DS}=48\text{V}$, $V_{GS}=10\text{V}$, $I_D=18\text{A}$		4		nC	
Gate to Drain Charge	Q_{GD}				4		nC	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=18\text{A}$, $R_G=3\Omega$			2		ns	
Rise Time	t_R				17		ns	
Turn-OFF Delay Time	$t_{D(OFF)}$				10		ns	
Fall-Time	t_F				17		ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Body-Diode Continuous Current		I_S				18	A	
Drain-Source Diode Forward Voltage		V_{SD}	$I_F=18\text{A}$, $V_{GS}=0\text{V}$			1.4	V	
Body Diode Reverse Recovery Time		t_{rr}	$I_S=18\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$			18	ns	
Body Diode Reverse Recovery Charge		Q_{rr}				7.3		nC

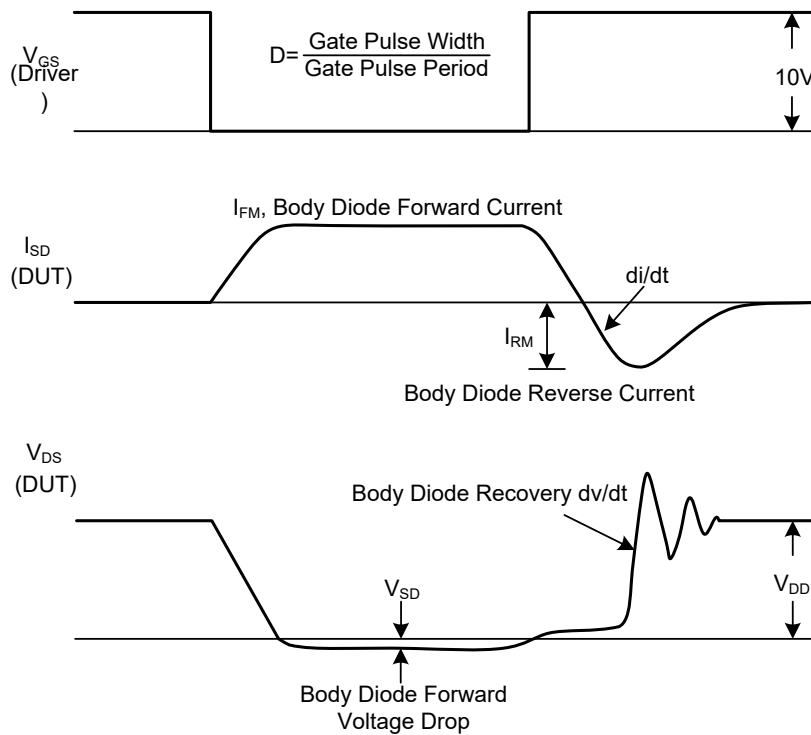
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

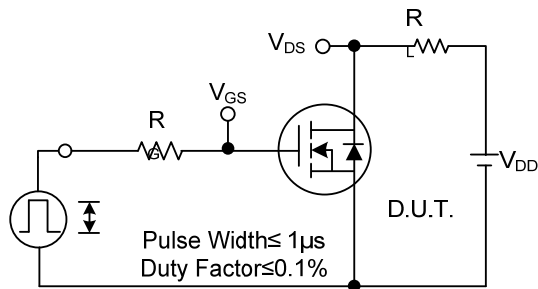


Peak Diode Recovery dv/dt Test Circuit

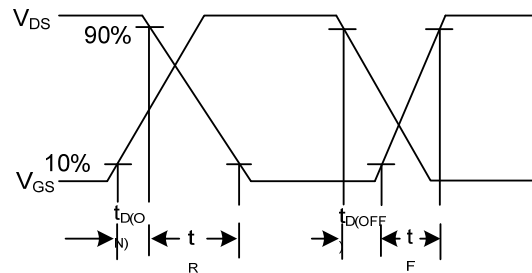


Peak Diode Recovery dv/dt Waveforms

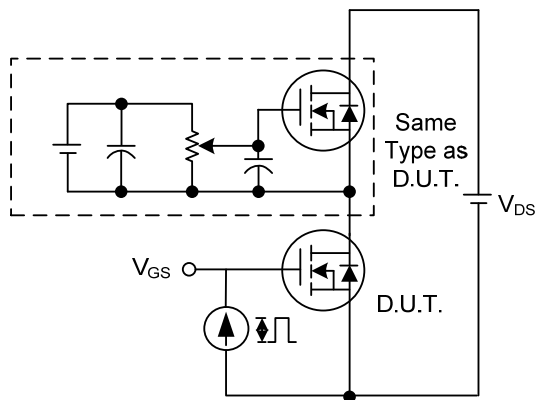
■ TEST CIRCUITS AND WAVEFORMS



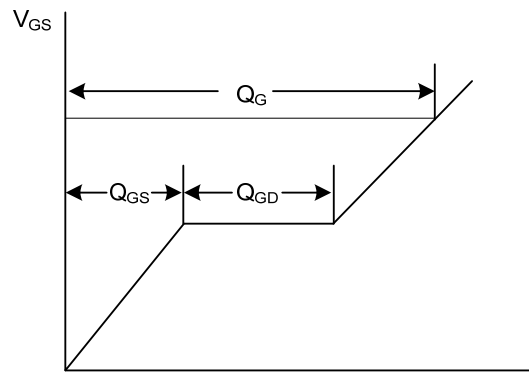
Switching Test Circuit



Switching Waveforms

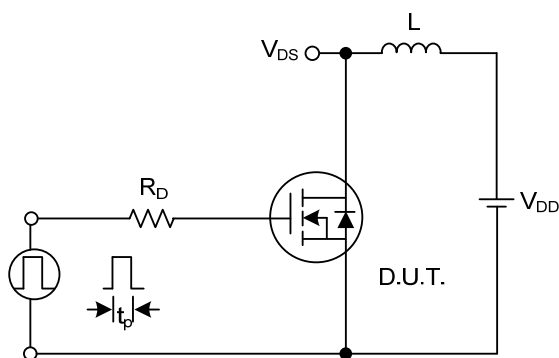


Gate Charge Test Circuit

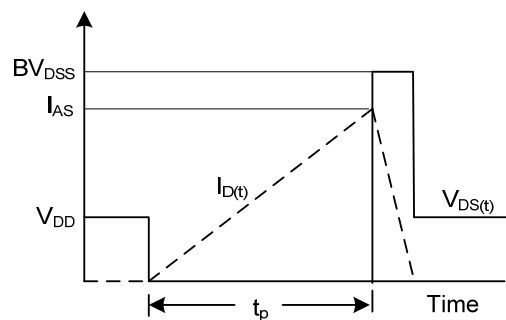


Charge

Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.