



**DUAL ENHANCEMENT MODE
(N-CHANNEL/P-CHANNEL)**

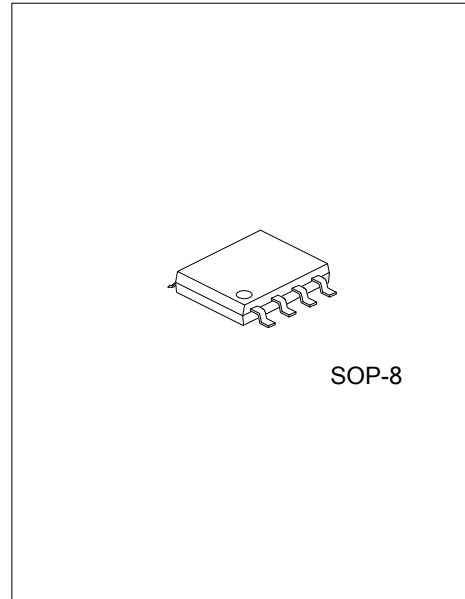
■ DESCRIPTION

The UTC **QS8M11** uses UTC's advanced technology to provide the customers with low voltage drive, etc.

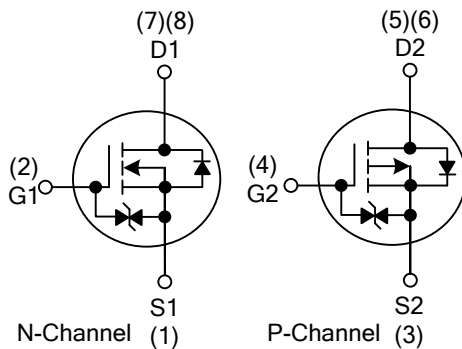
The UTC **QS8M11** is suitable for switching.

■ FEATURES

- * N-Channel: 30V, 3.5A
 $R_{DS(ON)} < 50m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 65m\Omega @ V_{GS} = 4.5V$
 $R_{DS(ON)} < 70m\Omega @ V_{GS} = 4.0V$
- * P-Channel: -30V, -3.0A
 $R_{DS(ON)} < 75m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 115m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 125m\Omega @ V_{GS} = -4.0V$
- * Low voltage drive (4V drive)
- * Low on-resistance



■ SYMBOL



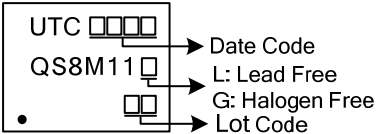
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
QS8M11L-S08-T	QS8M11G-S08-T	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tube
QS8M11L-S08-R	QS8M11G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

<p>QS8M11L-S08-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) L: Lead Free, G: Halogen Free</p>
--	---

■ MARKING



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

N-Channel

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	3.5	A
Pulsed Drain Current	I_{DM}	12	A
Power Dissipation	P_D	2	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

P-Channel

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	-3.0	A
Pulsed Drain Current	I_{DM}	-12	A
Power Dissipation	P_D	2	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. $P_W \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$, Mounted on a ceramic board.

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

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	1.0		2.5	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=3.5\text{A}$		35	50	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=3.5\text{A}$		45	65	$\text{m}\Omega$
		$V_{GS}=4.0\text{V}$, $I_D=3.5\text{A}$		50	70	$\text{m}\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=10\text{V}$, $f=1.0\text{MHz}$		180		pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			35		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DD}\approx 15\text{V}$, $V_{GS}=10\text{V}$, $I_D=1.7\text{A}$, $R_G=10\Omega$, $R_L=8.8\Omega$		10		ns
Turn-ON Rise Time	t_R			25		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25		ns
Turn-OFF Fall Time	t_F			7		ns
Total Gate Charge (Note2)	Q_G	$V_{GS}=5\text{V}$, $V_{DD}\approx 15\text{V}$, $I_D=3.5\text{A}$		3.5		nC
Gate-Source Charge	Q_{GS}			1		nC
Gate-Drain Charge	Q_{GD}			1		nC
SOURCE TO DRAIN DIODE SPECIFICATIONS						
Source to Drain Diode Voltage (Note 2)	V_{SD}	$I_S=3.5\text{A}$, $V_{GS}=0\text{V}$			1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				1.0	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				12	A

■ ELECTRICAL CHARACTERISTICS(Cont.)

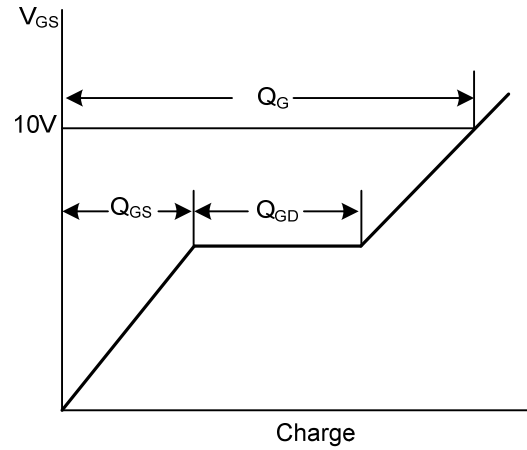
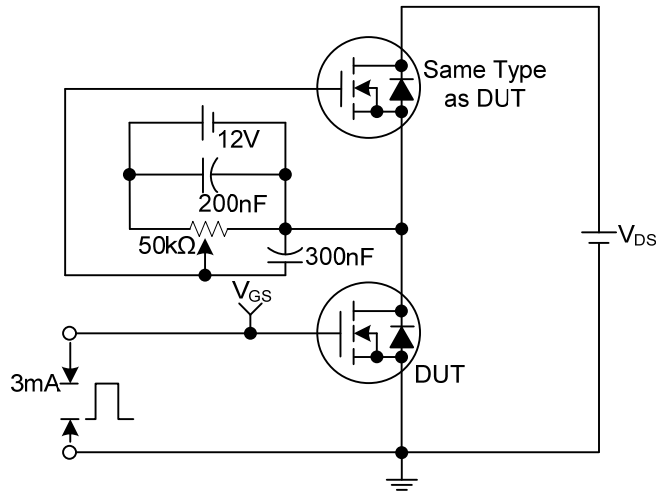
P-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-1mA, V_{GS}=0V$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=-10V, I_D=-1mA$	-1.0		-2.5	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-3.5A$		55	75	$m\Omega$
		$V_{GS}=-4.5V, I_D=-1.5A$		85	115	$m\Omega$
		$V_{GS}=-4.0V, I_D=-1.5A$		95	125	$m\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=-10V, f=1.0MHz$		480		pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			70		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DD}\approx -15V, V_{GS}=-10V, I_D=-1.5A, R_G=10\Omega, R_L=10\Omega$		7		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			50		ns
Turn-OFF Fall Time	t_F			35		ns
Total Gate Charge (Note2)	Q_G	$V_{GS}=-5V, V_{DD}\approx -15V, I_D=-3A$		5.2		nC
Gate-Source Charge	Q_{GS}			1.6		nC
Gate-Drain Charge	Q_{GD}			1.6		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=-3A, V_{GS}=0V$			-1.2	V
Continuous Drain-Source Diode Forward Current	I_S				-1.0	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				-12	A

- Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 3. Surface Mounted on $1in^2$ pad area, $t \leq 10$ sec.

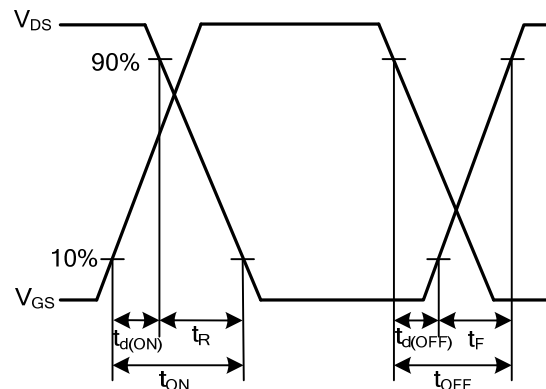
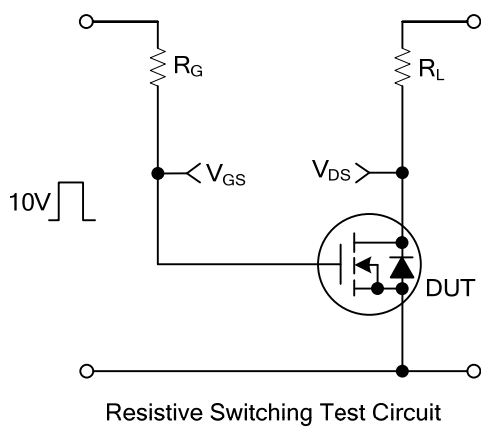
■ TEST CIRCUITS AND WAVEFORMS

N-CHANNEL



Gate Charge Test Circuit

Gate Charge Waveforms

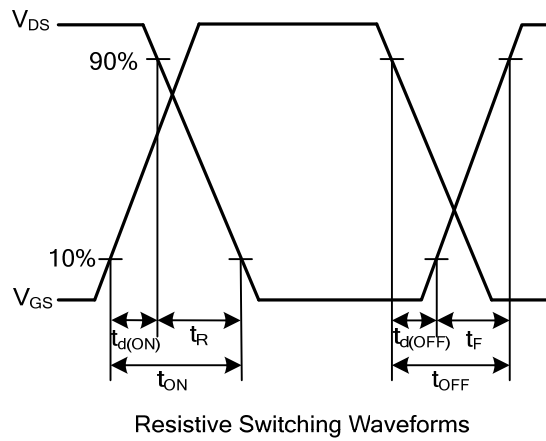
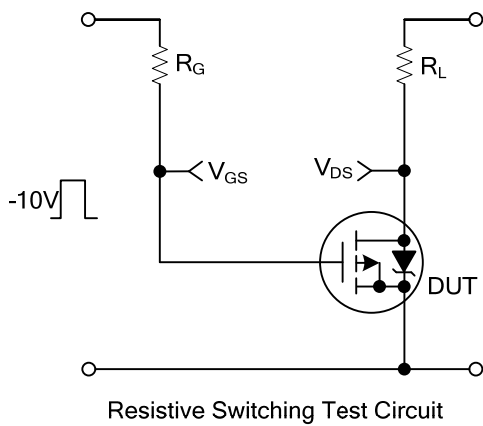
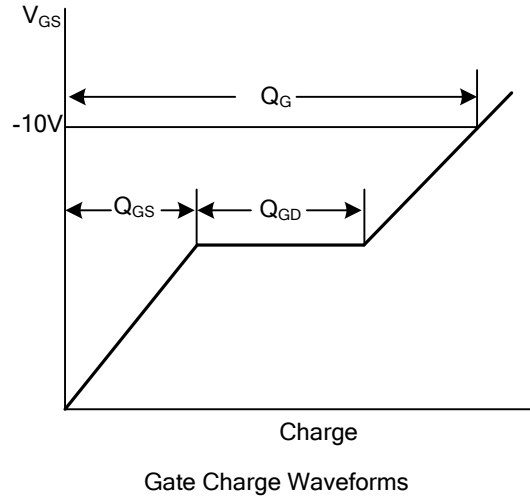
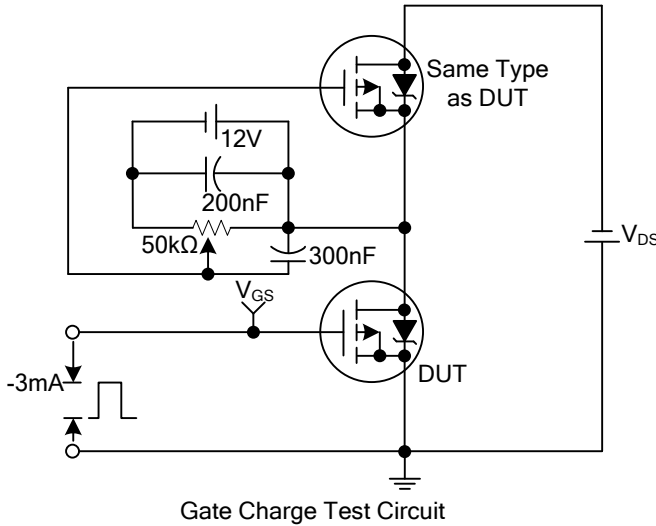


Resistive Switching Test Circuit

Resistive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)

P-CHANNEL



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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.