



**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

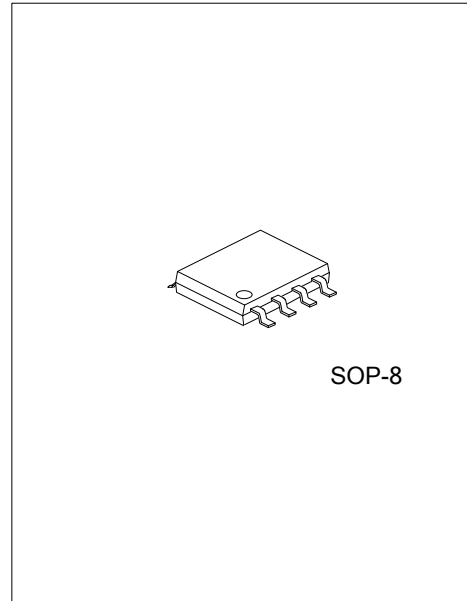
$R_{DS(ON)} < 75m\Omega @ V_{GS} = -10V$

$R_{DS(ON)} < 115m\Omega @ V_{GS} = -4.5V$

$R_{DS(ON)} < 125m\Omega @ V_{GS} = -4.0V$

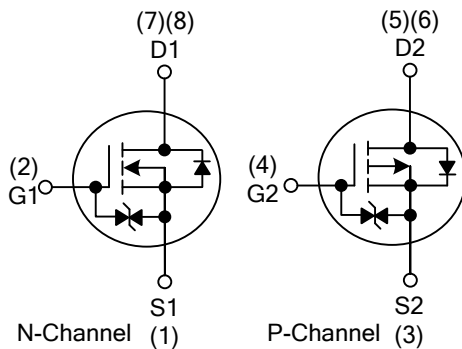
\* Low voltage drive (4V drive)

\* Low on-resistance



SOP-8

■ **SYMBOL**



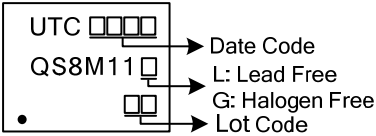
■ **ORDERING INFORMATION**

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>
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■ 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	$V_{GSS}$	$\pm 20$	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	$V_{GSS}$	$\pm 20$	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
<b>OFF CHARACTERISTICS</b>						
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	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			$\pm 10$	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>						
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	$\text{m}\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
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
<b>SWITCHING CHARACTERISTICS</b>						
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
<b>SOURCE TO DRAIN DIODE SPECIFICATIONS</b>						
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.)

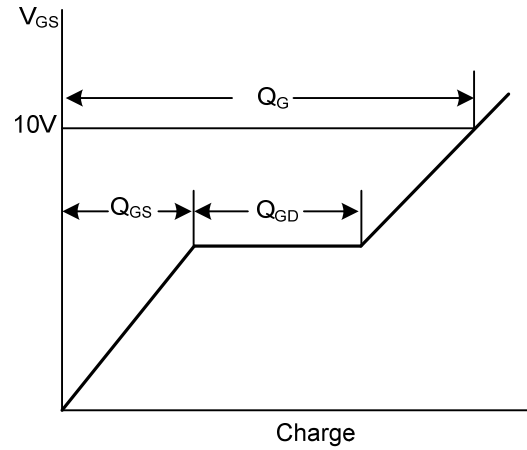
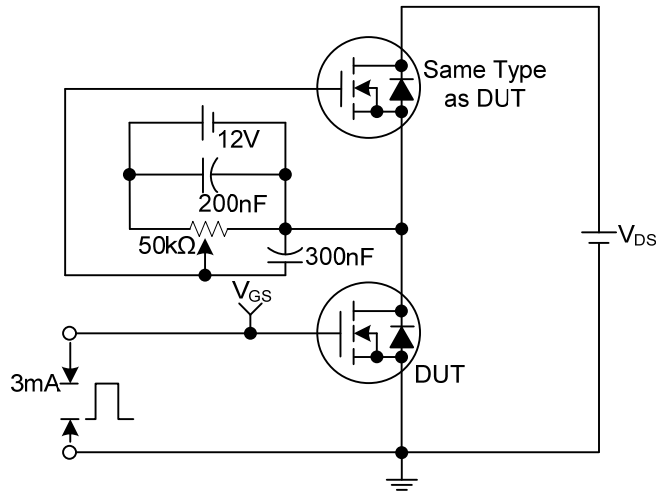
**P-CHANNEL**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
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	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
<b>ON CHARACTERISTICS</b>						
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	$m\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
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
<b>SWITCHING CHARACTERISTICS</b>						
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
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
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.

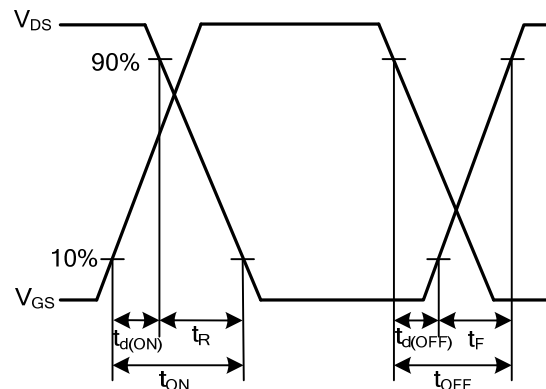
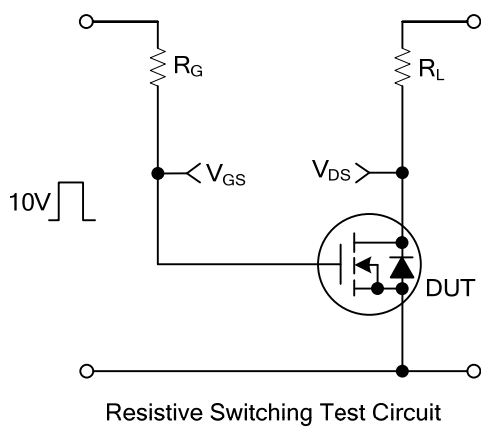
■ TEST CIRCUITS AND WAVEFORMS

N-CHANNEL



Gate Charge Test Circuit

Gate Charge Waveforms

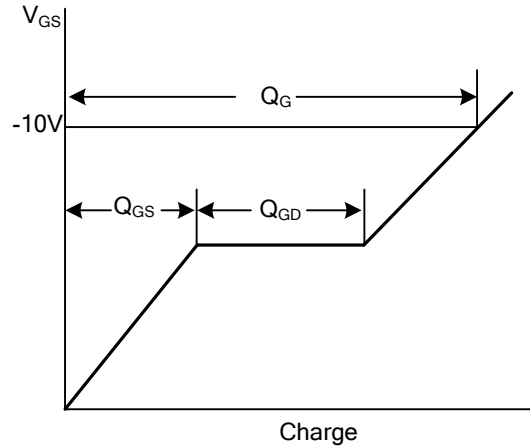
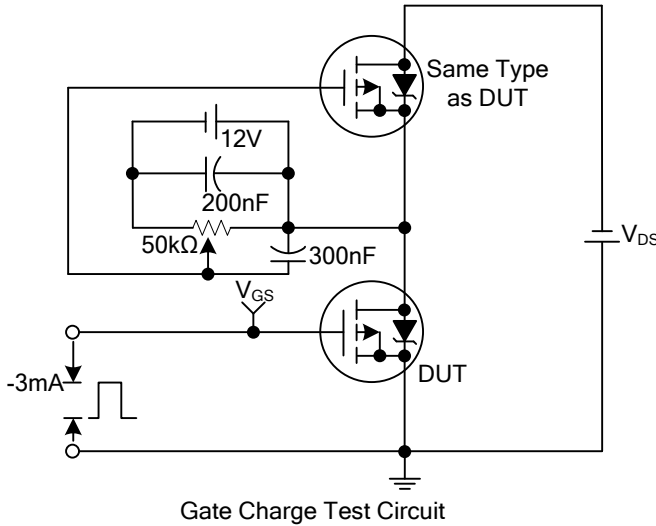


Resistive Switching Test Circuit

Resistive Switching Waveforms

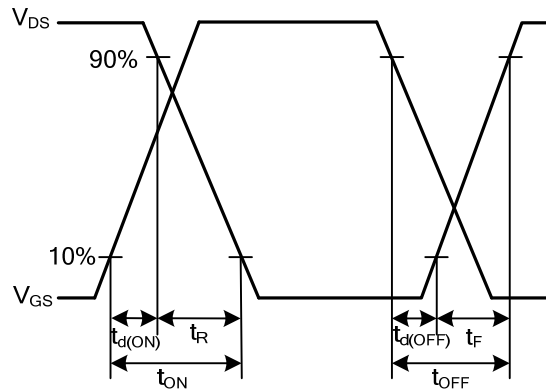
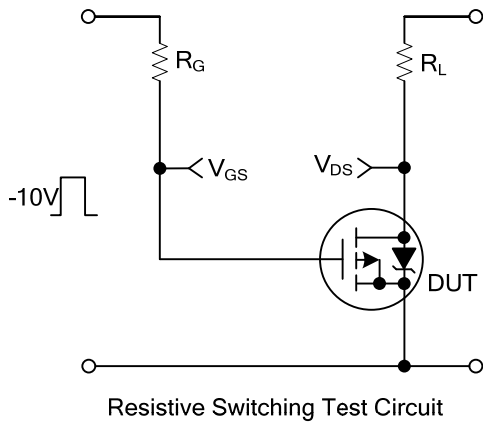
■ TEST CIRCUITS AND WAVEFORMS(Cont.)

P-CHANNEL



Gate Charge Test Circuit

Gate Charge Waveforms



Resistive Switching Test Circuit

Resistive Switching Waveforms

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