

**QS8M11**

Preliminary

Power MOSFET**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

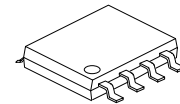
$R_{DS(ON)} < 75m\Omega$ @ $V_{GS} = -10V$

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

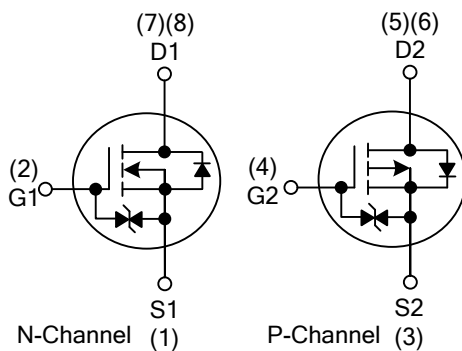
$R_{DS(ON)} < 125m\Omega$ @ $V_{GS} = -4.0V$

* Low voltage drive (4V drive)

* Low on-resistance



SOP-8

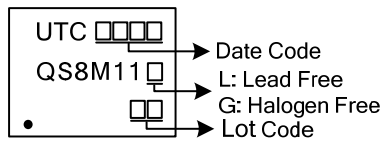
SYMBOL**ORDERING INFORMATION**

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

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

■ MARKING



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

N-Channel

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$ I_D	3.5	A
Pulsed Drain Current	$T_C=25^{\circ}\text{C}$ 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_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$ I_D	-3.0	A
Pulsed Drain Current	$T_C=25^{\circ}\text{C}$ 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.)

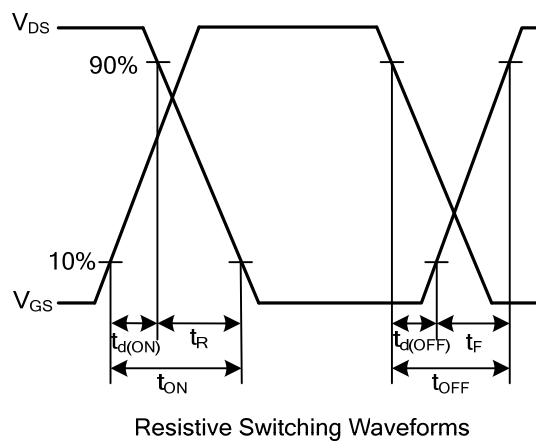
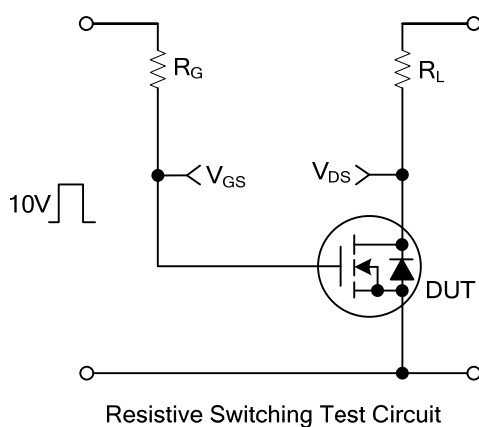
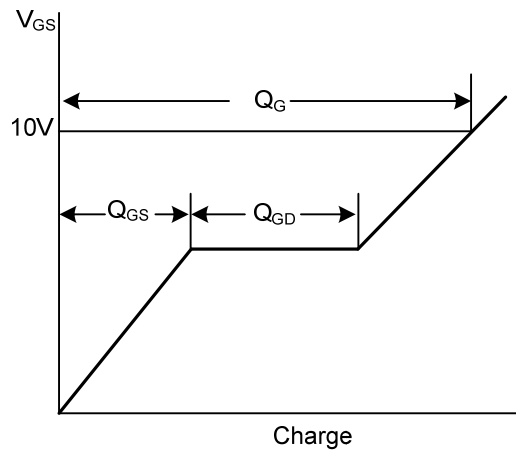
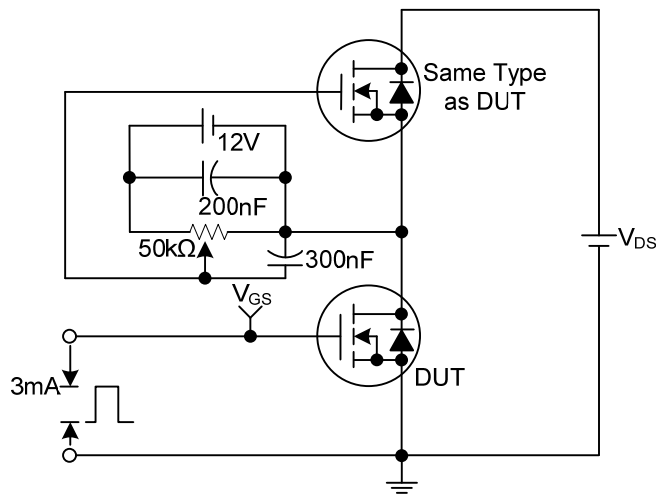
P-CHANNEL

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 Ω
		$V_{GS}=-4.5V, I_D=-1.5A$		85	115	m Ω
		$V_{GS}=-4.0V, I_D=-1.5A$		95	125	m Ω
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.

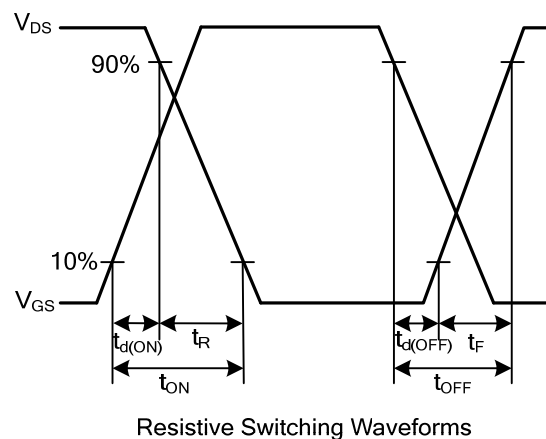
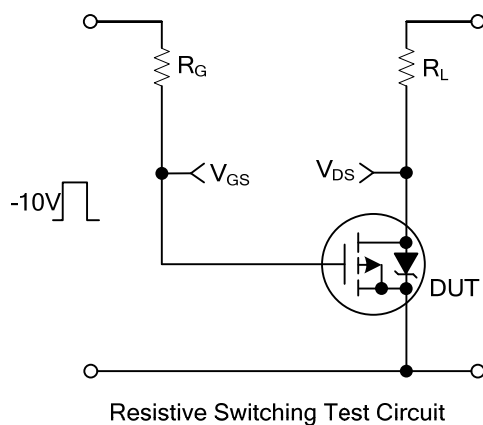
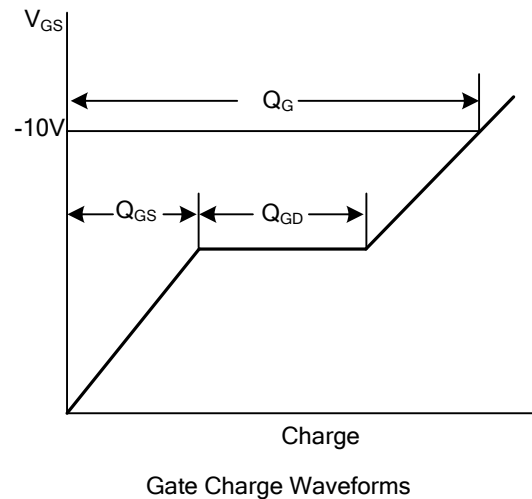
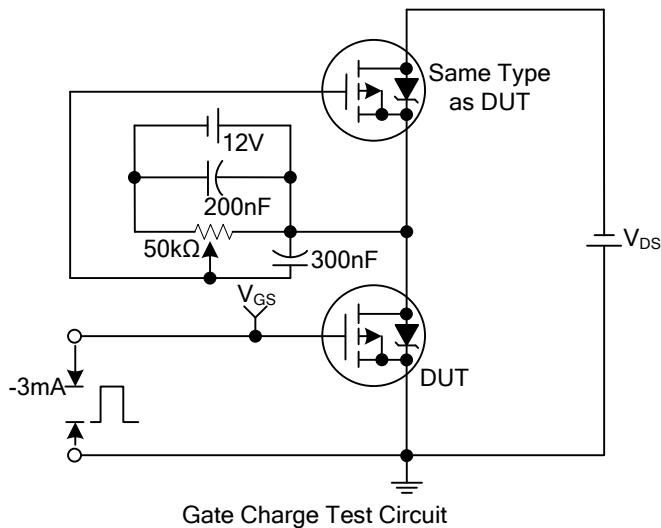
■ TEST CIRCUITS AND WAVEFORMS

N-CHANNEL



■ TEST CIRCUITS AND WAVEFORMS(Cont.)

P-CHANNEL



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