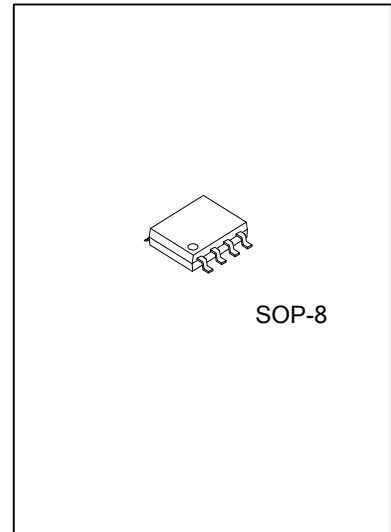




# DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET



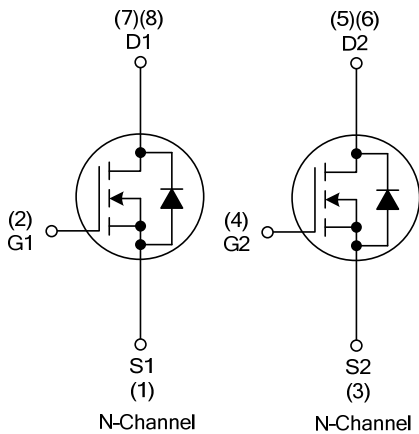
#### DESCRIPTION

The UTC **12NN10** is a dual N-Channel enhancement mode power MOSFET, it provides designer with fast switching speed, ruggedized device design, low on-resistance and cost-effectiveness.

#### FEATURES

- \* Low Gate Charge (Typically 10nC)
- \* 2.5A, 100V, 150mΩ @ V<sub>GS</sub>=10V
- \* Fast Switching Speed
- \* Simple Drive Requirement

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
12NN10L-S08-R	12NN10G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

<p>12NN10L - S08 - R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$  unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous(Note 3)	$I_D$	2.5	A
	Pulsed(Note 2)	$I_{DM}$	10	A
Power Dissipation		$P_D$	2	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^\circ\text{C}$

- Note: 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. Pulse width limited by Max. junction temperature.  
 3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board,  $t < 10\text{sec}$ ;  $135^\circ\text{C/W}$  when mounted on Min. copper pad.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient (Note 1)	$\theta_{JA}$	62.5	$^\circ\text{C/W}$

- Note: 1. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board,  $t < 10\text{sec}$ ;  $135^\circ\text{C/W}$  when mounted on Min. copper pad.

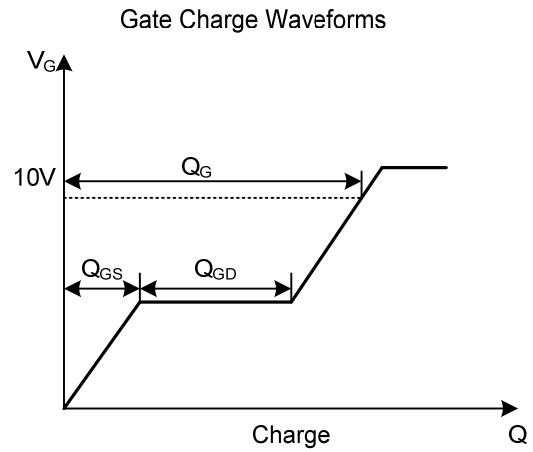
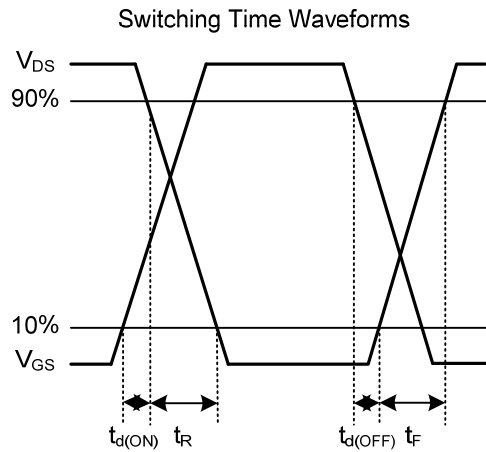
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage		$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	100			V	
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=80\text{V}, V_{GS}=0\text{V}$			10	$\mu\text{A}$	
Gate-Source Leakage Current	Forward	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=20\text{V}$			100	nA	
	Reverse		$V_{DS}=0\text{V}, V_{GS}=-20\text{V}$			-100	nA	
<b>ON CHARACTERISTICS</b>								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		3	V	
Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=2\text{A}$			150	m $\Omega$	
Forward Transconductance		$g_{FS}$	$V_{DS}=10\text{V}, I_D=2\text{A}$		2.8		S	
<b>DYNAMIC PARAMETERS</b>								
Input Capacitance		$C_{ISS}$	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$		420	672	pF	
Output Capacitance		$C_{OSS}$				60		pF
Reverse Transfer Capacitance		$C_{RSS}$				40		pF
<b>SWITCHING PARAMETERS</b>								
Total Gate Charge (Note 1)		$Q_G$	$V_{DS}=80\text{V}, V_{GS}=10\text{V}, I_D=2\text{A}$		10	16	nC	
Gate-Source Charge		$Q_{GS}$				2		nC
Gate-Drain Charge		$Q_{GD}$				4		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	$V_{DS}=50\text{V}, I_D=2\text{A}, R_G=3.3\Omega$		6.5		ns	
Turn-ON Rise Time		$t_R$				7		ns
Turn-OFF Delay Time		$t_{D(OFF)}$		$V_{GS}=10\text{V}$		14		ns
Turn-OFF Fall Time		$t_F$				3.5		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>								
Drain-Source Diode Forward Voltage (Note 1)		$V_{SD}$	$I_S=1.5\text{A}, V_{GS}=0\text{V}$			1.3	V	

Body Diode Reverse Recovery Time (Note 1)	$t_{RR}$	$V_{GS}=0V, I_S=2A,$ $di_F/dt=100A/\mu s$	40	ns
Body Diode Reverse Recovery Charge	$Q_{RR}$		75	nC

Note: 1. Pulse test

### ■ TEST CIRCUITS AND WAVEFORMS



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