

1. Description

The UMW UCC27710DR is a high voltage, high speed power MOSFET drivers with dependent high- and low-side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output, down to 3.3 V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver crossconduction. The floating channel can be used to drive an N-channel power MOSFET in the high-side configuration which operates up to 600 V

3. Features

- Floating channel designed for bootstrap operation
- Fully operational to +650V
- 3.3 V, 5V and 15V logic compatible
- dV/dt noise Immunity ± 50 V/ns
- Under voltage lockout for both channels
 - VCC UVLO threshold 8.7V/7.7V
 - VBS UVLO threshold 8.2V/7.3V
- Propagation delay
 - Ton/Toff = 250ns/150ns

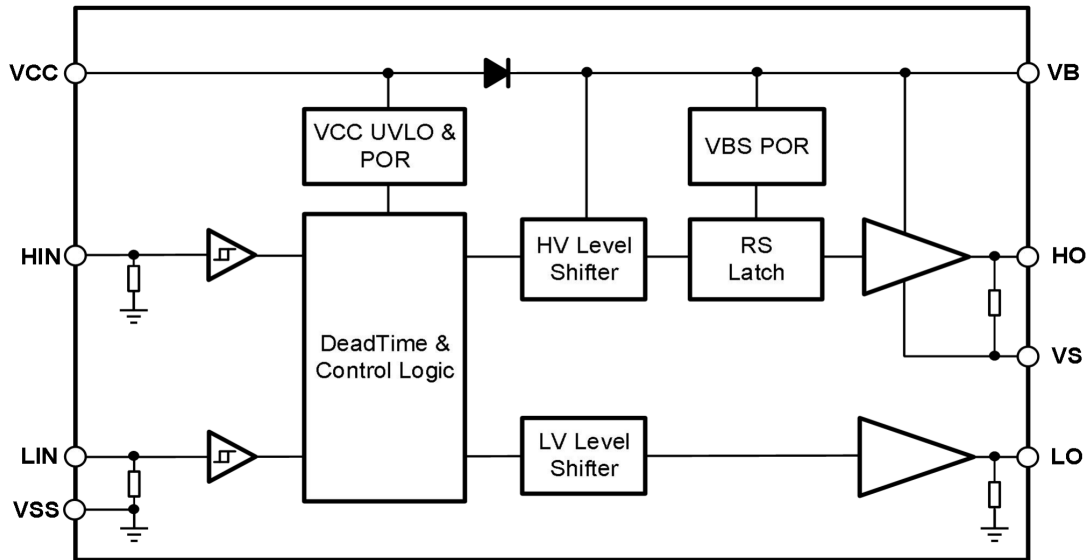
2. Application

- Motor Control
- Air Conditioners/ Washing Machines
- General Purpose Inverters
- Micro/Mini Inverter Drives

- --Matching delay time 50ns
- Cross-conduction prevention logic
 - Deadtime 130ns
- Wide operating temperature range
 - 40°C ~125°C
 - Typically output Source/Sink current capability: 0.6A/1A

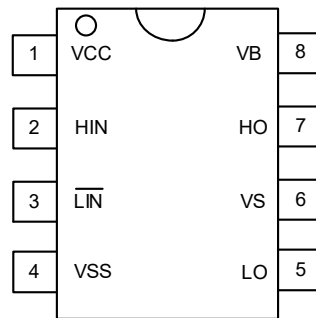


4. Functional Block Diagram





5. Pinning Information



SOP-8

Lead Definitions

Number	Symbol	Description
1	V_{CC}	Low side and logic fixed supply
2	HIN	Logic input for high side gate driver output (HO), in phase
3	\overline{LIN}	Logic input for low side gate driver output (LO), out of phase
4	V_{SS}	Low side return
5	LO	Low side gate drive output
6	V_S	High side floating supply return
7	HO	High side gate drive output
8	V_B	High side floating supply



6. Absolute Maximum Ratings

Exceeding the limit maximum rating may cause permanent damage to the device. All voltage parameters are rated with reference to V_{SS} and an ambient temperature of 25°C.

Parameter	Symbol	Min	Max	Units
High side floating supply	V_B	-0.3	650	V
High side floating supply return	V_S	V_B-25	$V_B+0.3$	V
High side gate drive output	V_{HO}	$V_S-0.3$	$V_B+0.3$	V
Low side and main power supply	V_{CC}	-0.3	25	V
Low side gate drive output	V_{LO}	-0.3	$V_{CC}+0.3$	V
Logic input of HIN & \overline{LIN}	V_{IN}	-0.3	$V_{CC}+0.3$	V
Allowable Offset Supply Voltage Transient	dV_S/dt	-	50	V/ns

7. ESD Rating

Parameter	Symbol	Min	Max	Units
HBM Model	ESD	1500	-	V
Machine Model		500	-	V

8. Rated Power

Parameter	Symbol	Min	Max	Units
Package Power Dissipation @ $T_A \leq 25^\circ\text{C}$	PD1	-	625	mW



9. Thermal Information

Parameter	Symbol	Min	Max	Units
Thermal Resistance, Junction to Ambient	R_{thJA}	-	200	°C/W
Junction Temperature	T_J	-	150	°C
Storage Temperature	T_S	-55	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	-	300	°C

10. Recommended Operating Conditions

For proper operation, the device should be used under the following recommended conditions. The bias ratings of VS and VSS are measured at a supply voltage of 15V, and unless otherwise specified, the ratings of all voltage parameters are referenced to VSS and the ambient temperature is 25°C.

Parameter	Symbol	Min	Max	Units
High side floating supply	V_B	$V_S + 10$	$V_S + 20$	V
High side floating supply return	V_S	-9	600	V
High side gate drive output	V_{HO}	V_S	V_B	V
Low side and main power supply	V_{CC}	10	20	V
Low side gate drive output	V_{LO}	0	V_{CC}	V
Logic input of HIN & \overline{LIN}	V_{IN}	0	V_{CC}	V
Ambient temperature	T_A	-40	125	°C

Note1: Transient negative VS can be used for VSS-50V with a pulse width of 50ns, guaranteed by design.



11. Dynamical Electrical Characteristics

Valid for temperature range at $T_A=25^{\circ}\text{C}$, $V_{CC}=V_B=15\text{V}$, $C_L=1\text{nF}$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Turn-on propagation delay	t_{ON}	$V_S=0\text{V}$		250	300	ns
Turn-off propagation delay	t_{OFF}	$V_S=600\text{V}$		150	200	ns
Turn-on rise time	t_R			70	130	ns
Turn-off fall time	t_F			35	70	ns
Deadtime	DT				50	ns
Matching delay ON and OFF	MT				50	ns
Matching delay	MDT				60	ns



12. Static Electrical Characteristics

Valid for temperature range at $T_A=25^\circ\text{C}$, $V_{CC}=V_B=15\text{V}$, $C_L=1\text{nF}$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
V_{CC} supply UVLO threshold	V_{CCUV+}		7.7	8.7	9.7	V
	V_{CCUV-}		6.7	7.7	8.7	V
hysteresis of V_{CC} UVLO	$V_{CCUVHYS}$			1		V
V_{BS} supply UVLO threshold	V_{BSUV+}		7.2	8.2	9.2	V
	V_{BSUV-}		6.3	7.3	8.3	V
hysteresis of V_{BS} UVLO	$V_{BSUVHYS}$			0.9		V
High-side floating supply leakage current	I_{LK}	$V_B=V_S=600\text{V}$			50	μA
Quiescent V_B supply current	I_{QBS}	$V_{IN}=0\text{V}$		35	100	μA
Quiescent V_{CC} supply current	I_{QCC}	$V_{IN}=0\text{V}$		60	150	μA
Logic "1" (\overline{HIN} & \overline{LIN}) input voltage	V_{IH}	$V_{CC}=10\text{V to }20\text{V}$	2.5			V
Logic "0" (\overline{HIN} & \overline{LIN}) input voltage	V_{IL}	$V_{CC}=10\text{V to }20\text{V}$			0.8	V
High level output voltage, $V_{BIAS}-V_O$	V_{OH}	$I_O=0\text{A}$			0.2	V
Low level output voltage, V_O	V_{OL}	$I_O=0\text{A}$			0.2	V
Logic "1" Input bias current	I_{IN+}	$\overline{HIN}=5\text{V}, \overline{LIN}=5\text{V}$		25	60	μA
Logic "0" input bias current	I_{IN-}	$\overline{HIN}=0\text{V}, \overline{LIN}=5\text{V}$			5	μA
Output high short circuit pulsed current	I_{O+}	$V_O=0\text{V}, PW\leq 10\mu\text{s}$	0.27	0.6		A
Output low short circuit pulsed current	I_{O-}	$V_O=15\text{V}, PW\leq 10\mu\text{s}$	0.4	1		A



13.Function Description

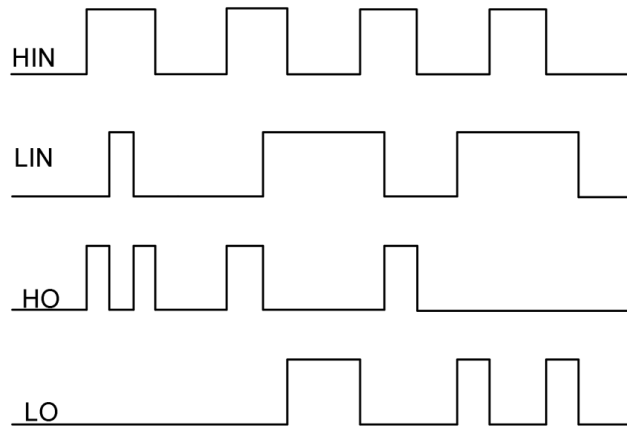


Figure 1. UCC27710 Input and output timing waveform

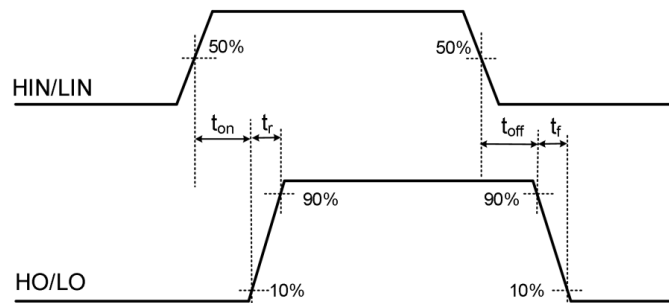


Figure 2. Propagation Time Waveform Definition

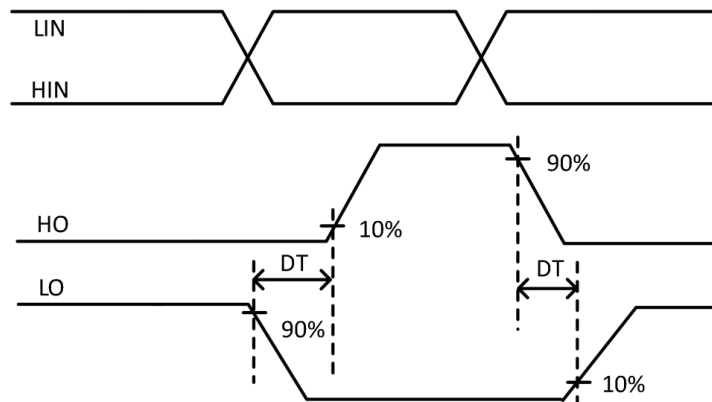


Figure3. Cross Conduction Prevention Delay Time Waveform Definition

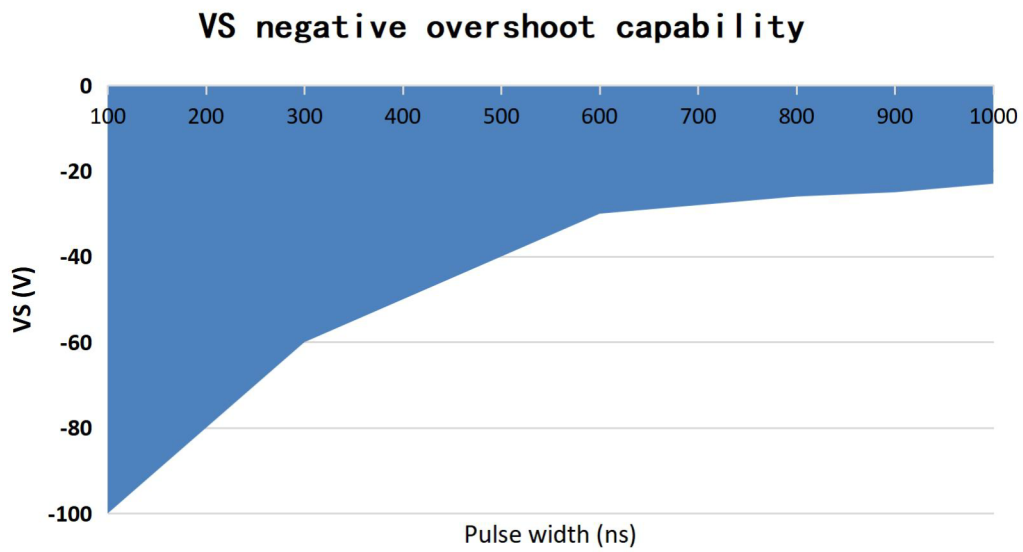
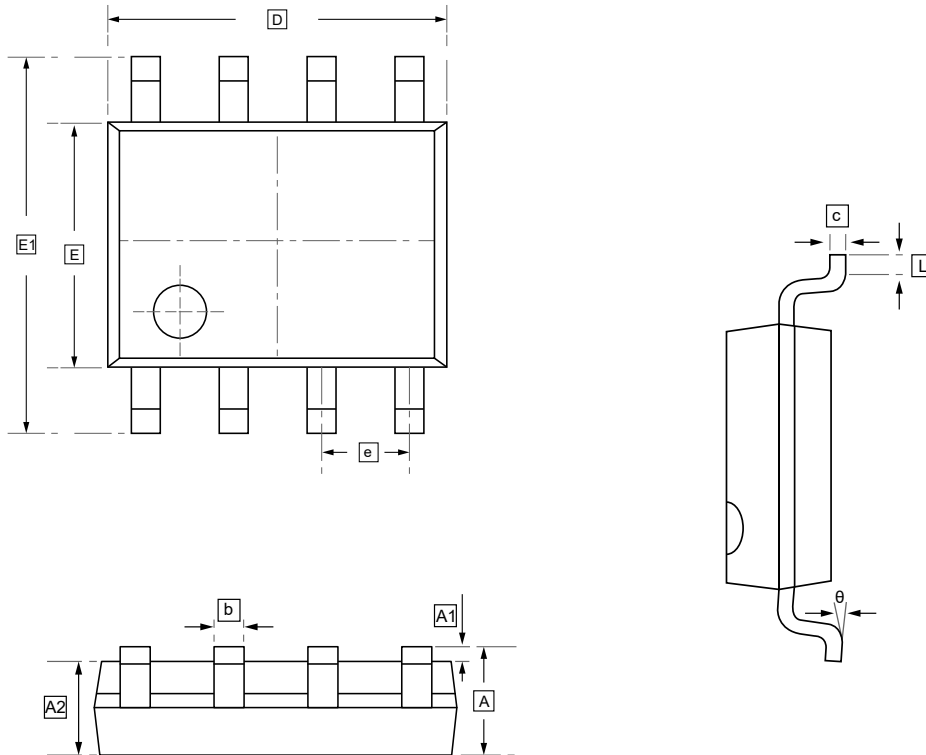


Figure 4. The relationship between VS negative overshoot and duration



16.SOP-8 Package Outline Dimensions

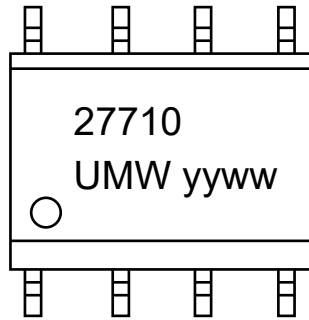


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



17. Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW UCC27710DR	SOP-8	2500	Tape and reel



18.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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