## General Description

The U3215/FU3216 Fully operated to +600V is high voltage, high speed power MOSFET and IGBT driver with dependent high and low side referenced output channels.

The logic input is compatible with standard CMOS or LSTTL output, down to 3.3V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high side configuration which operates up to 600 volts.

Packages

8-Lead SOP
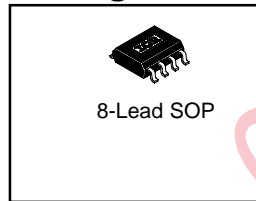
Key Features

· Floating channel designed for bootstrap operation
· Fully operational to +600V
· Tolerant to negative transient voltage dV/dt immune
· Gate drive supply range from 10 to 20V
· Undervoltage lockout
· 3.3V, 5V and 15V input logic compatible
· Cross-conduction prevention logic
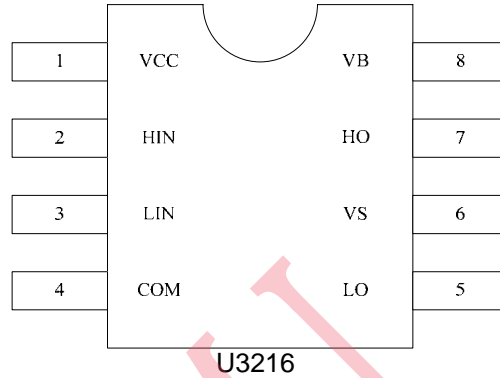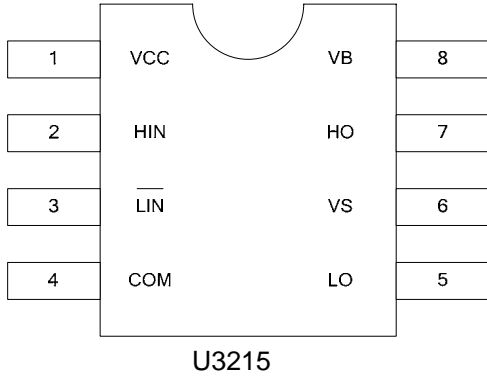· Matched propagation delay for both channels

Product Summary

V_{OFFSET}	600V max
I_O+/-	2.0 A / 2.5A
V_{OUT}	8 -25V
$VCC_{on/off}$ (typ.)	10V & 10.3V
$t_{on/off}$ (typ.)	600 & 280ns
Deadtime (typ.)	200 ns
Work Tem	-40 ~150 °C

Products Information

Base Part Number	Package Type	Standard OUT		V_{OFFSET}	Logic Control
		IO+	IO-		
U3215	SOP8	2.0A	2.5A	600V	HIN & $\overline{\text{LIN}}$
U3216	SOP8	2.0A	2.5A	600V	HIN & LIN

Pin Assignments

U3215

U3216

Pin Function

Number	Symbol	Description
1	VCC	Low side and logic fixed supply
2	HIN	Logic input for high side gate driver outputs (HO), in phase
3	LIN	Logic input for low side gate driver outputs (LO), in phase
	$\overline{\text{LIN}}$	Logic input for low side gate driver outputs (LO), out of phase
4	COM	Low side return
5	LO	Low side gate drive output
6	VS	High side floating supply return
7	HO	High side gate drive output
8	VB	High side floating supply

Typical Connection

Up to 600V

Up to 600V
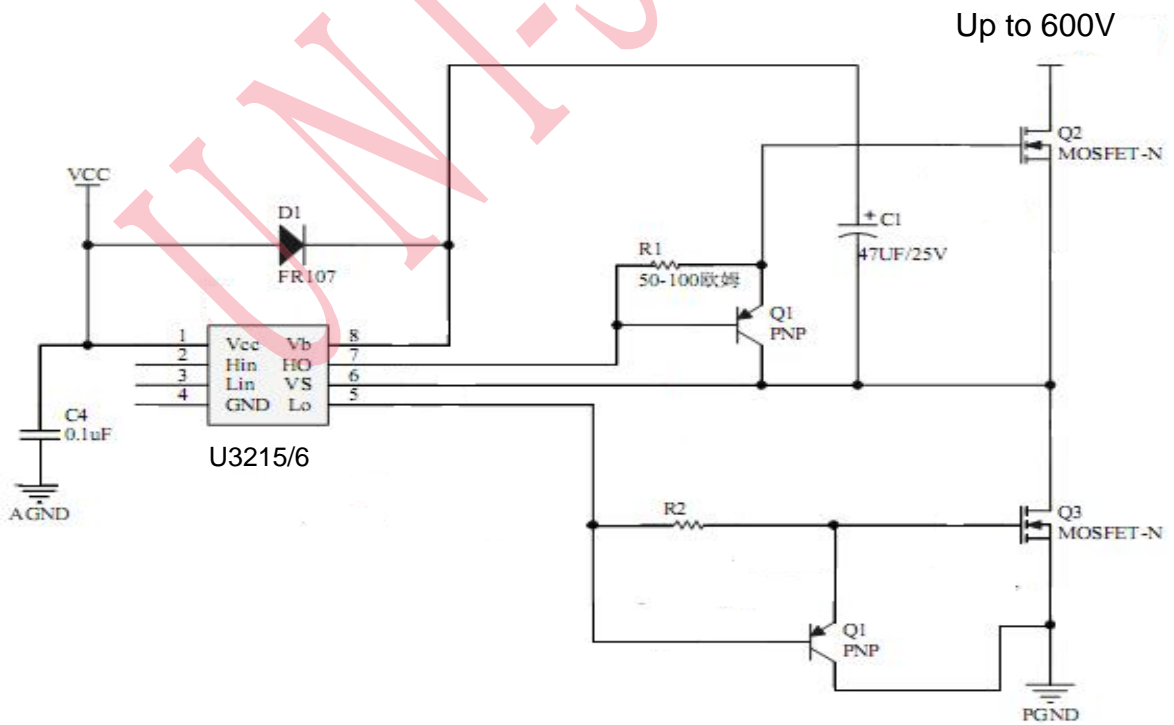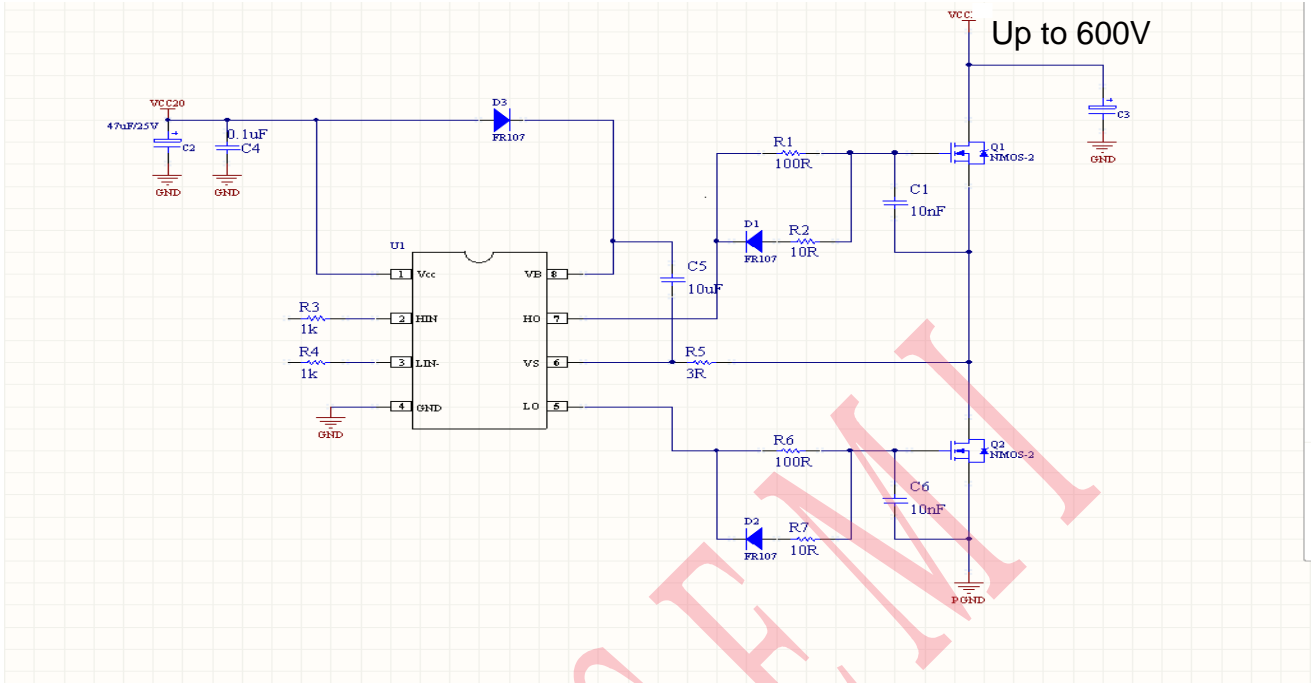
Much Big POWER application

Absolute Maximum Ratings

Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

Symbol	Definition	Min.	Max.	Units
VB	High side floating absolute voltage	-0.3	600	V
VS	High side floating supply offset voltage	VB-25	VB+0.3	
VHO	High side floating output voltage	VS-0.3	VB+0.3	
VLO	Low side output voltage	-0.3	Vcc+0.3	
Vcc	Low side and logic fixed supply voltage	-0.3	25	
VIN	Logic input voltage (HIN & LIN)	-0.3	Vcc+0.3	
dVS/dt	Allowable offset supply voltage transient		55	V/ns
P_D	Package power dissipation @ TA ≤ +25°C DIP-8		1	W
	Package power dissipation @ TA ≤ +25°C SOIC-8		0.625	
Rth_{JA}	Thermal resistance, junction to ambient DIP-8		125	°C/W
	Thermal resistance, junction to ambient SOIC-8		200	
TJ	Junction temperature	-35	150	°C
TS	Storage temperature	-55	175	
TL	Lead temperature (soldering, 10 seconds)		300	

Recommended Operating Conditions

The Input/Output logic timing diagram is shown in Figure 1. For proper operation the device should be used within the recommended conditions. The VS offset rating is tested with all supplies biased at 15V differential.

Symbol	Definition	Min.	Max.	Units
VB	High side floating supply absolute voltage	VS + 10	VS + 20	V
VS	High side floating supply offset voltage	-25	600	
VHO	High side floating output voltage	VS	VB	
VLO	Low side output voltage	0	VCC	
VCC	Low side and logic fixed supply voltage	10	20	
VIN	Logic input voltage (HIN&LIN)	0	VCC	
TA	Ambient temperature	-40	150	°C

Electrical Characteristic

$V_{CC} = V_{BS} = V_{BIAS} = 15V$, CL   1000pF   TA = 25°C ,   unless otherwise specified.

Symbol	Definition	Min.	Typ.	Max.	Units	Test Conditions
tr	Turn-on rise time	—	72	120		
tf	Turn-off fall time	—	15	45		
ton	Turn-on propagation delay	—	200	240		VS = 0V
toff	Turn-off propagation delay	—	154	240	ns	VS =400V
DT	Deadtime, LS turn-off to HS turn-on & HS turn-on to LS turn-off	—	100	190		
MT	Delay matching, HS & LS turn-on/off	—	—	70		

Electrical Characteristic

$V_{CC} = V_{BS} = V_{BIAS} = 15V$ TA = 25°C   unless otherwise specified.

| Symbol	Definition	Min.	Typ.	Max.	Units	Test Conditions
VCCUV+	VCC supply undervoltage positive going threshold	10	10.3	10.5	V	
VCCUV-	VCC supply undervoltage negative going threshold	9.8	10	10.2		
IQCC	Quiescent VCC supply current		300	500	uA	Vin =0V or5V
IQBS	Quiescent VBS supply current		100	200		Vin =0V or5V
ILK	Offset supply leakage current			3		VB =VS =400V
VIH	Logic "1" (HO) & Logic "0" (LO) input voltage	3				VCC =10V to20V
VIL	Logic "0" (HO) & Logic "1" (LO) input voltage			0.8		VCC =10V to20V
IIN+	Logic "1" input bias current		3	10	uA	V_{IN} =5V L_{IN} = 0V
IIN-	Logic "0" input bias current			1		V_{IN} =5V L_{IN} = 0V
VOH	High level output voltage, VBIAS - VO			100	mV	Io =0A
VOL	Low level output voltage, VO			100		Io =0A
IO+	Output high short circuit pulsed current	2000	2200		mA	VO = 0V, V_{IN} = V_{IH} PW ≤ 10 us
IO-	Output low short circuit pulsed current	2200	2500			VO = 15V, V_{IN} = V_{IL} PW ≤ 10 us

Block Diagram
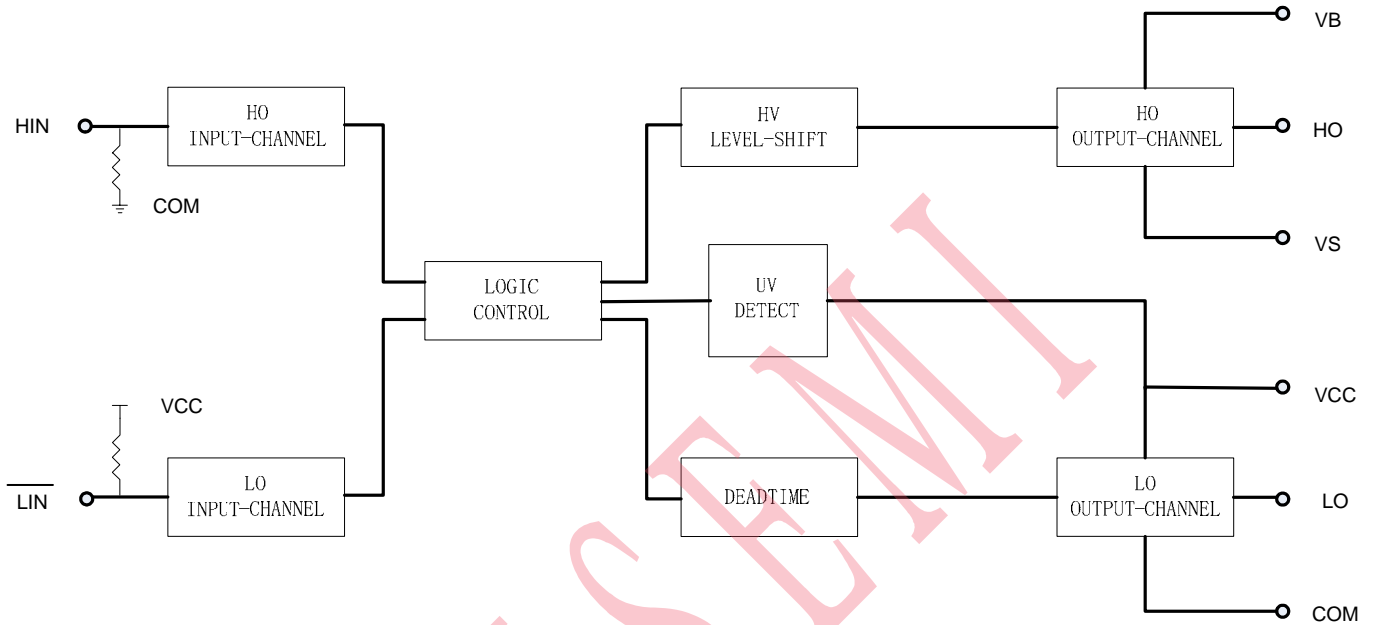
U3215
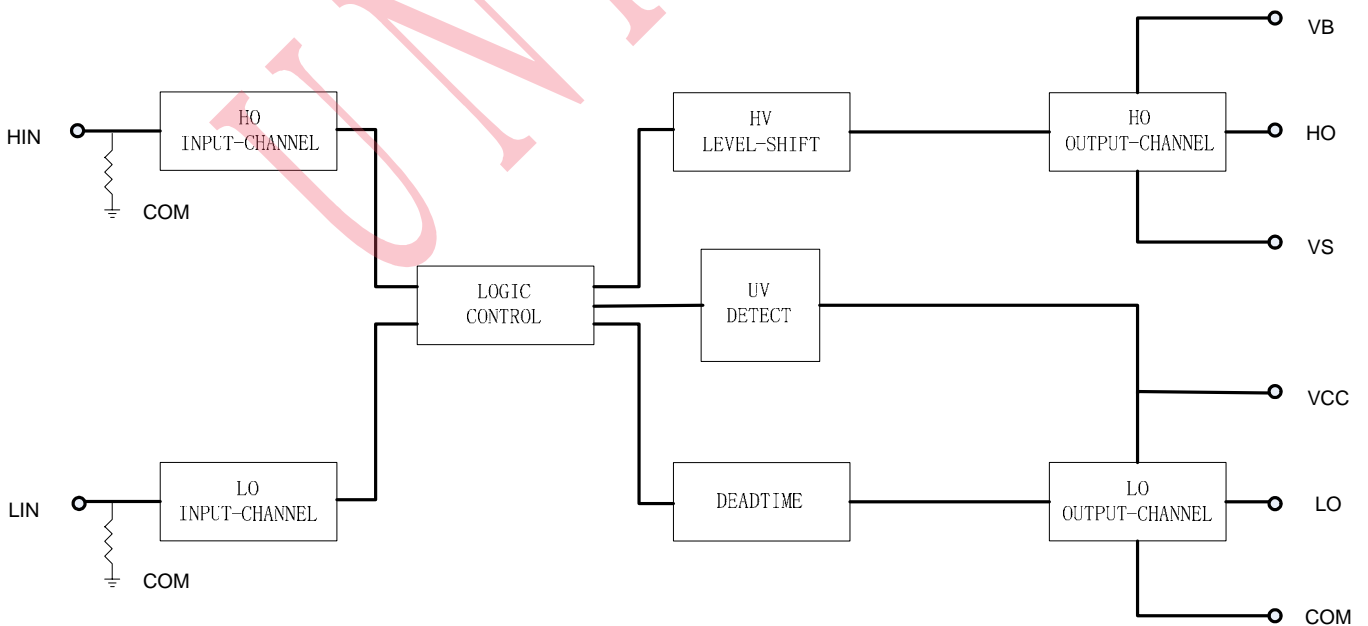
U3216

Time waveform

HIN

$\overline{LIN}$

HO

LO

U3215

HIN

LIN
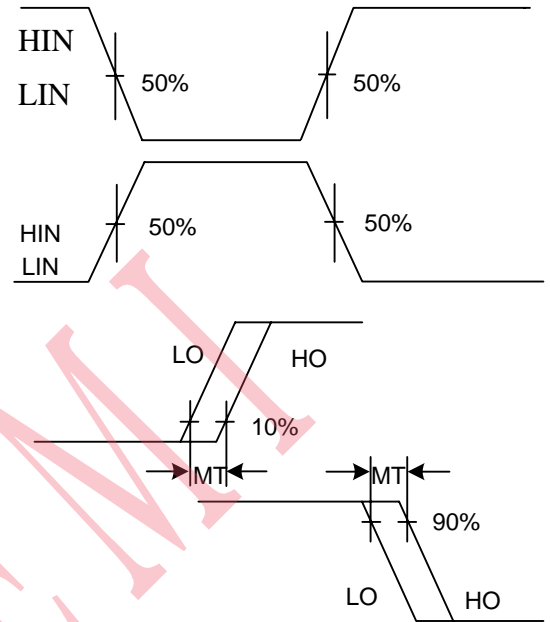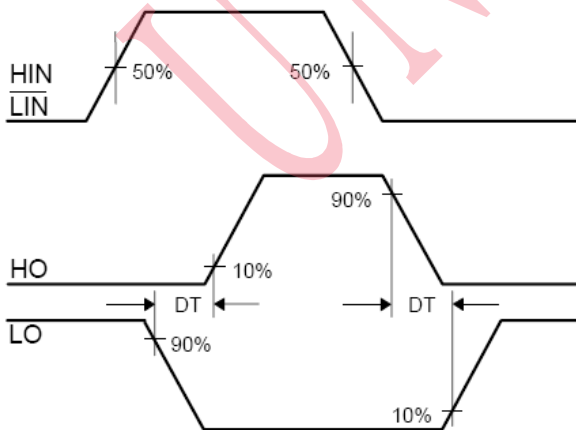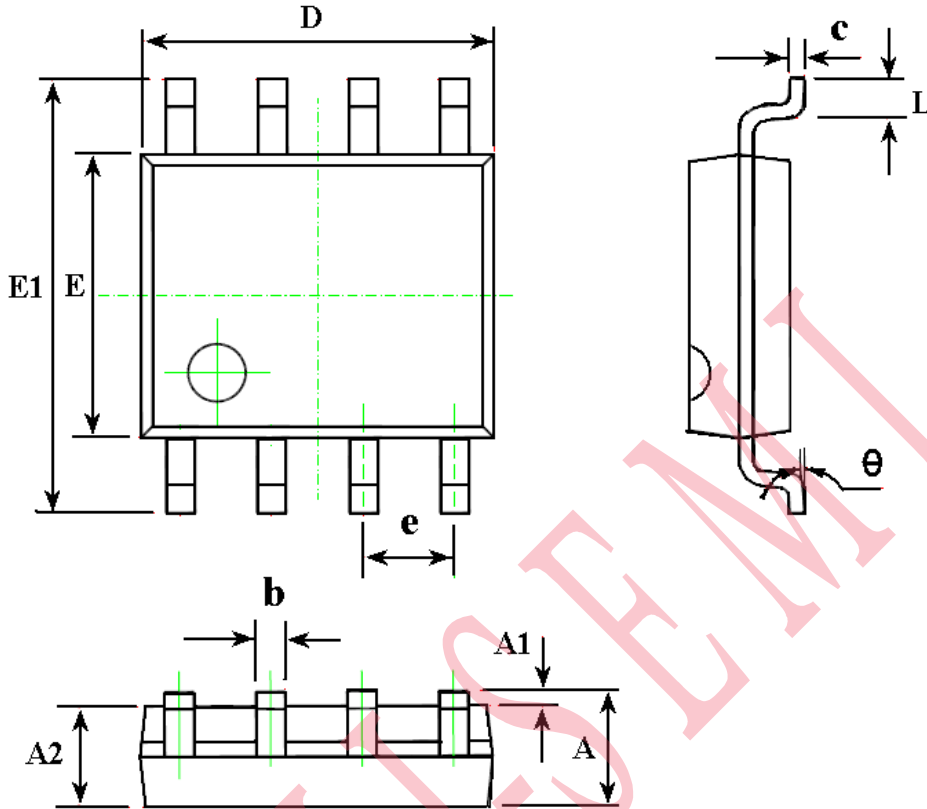
HO

LO
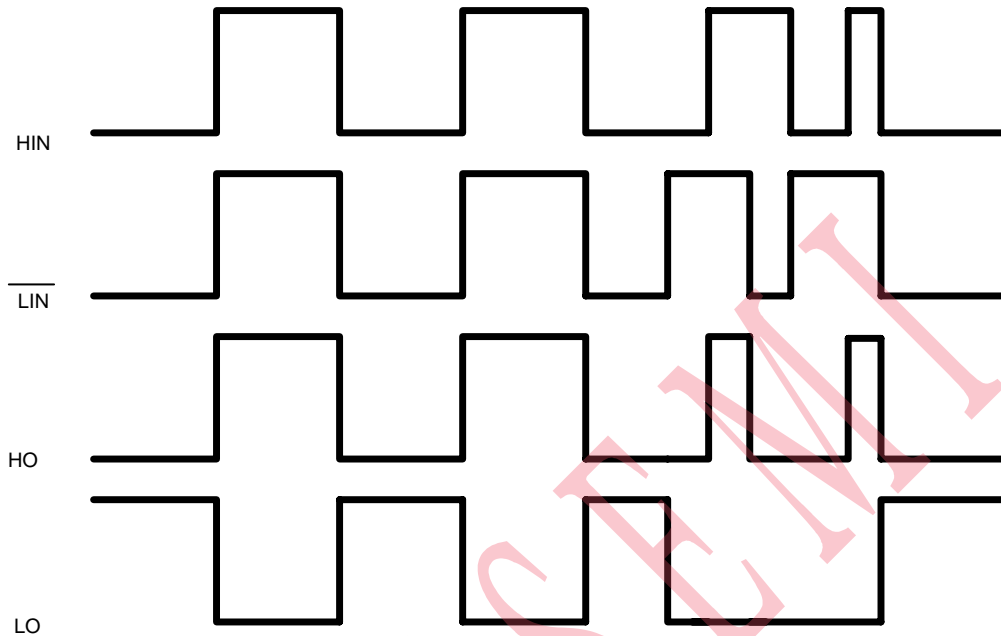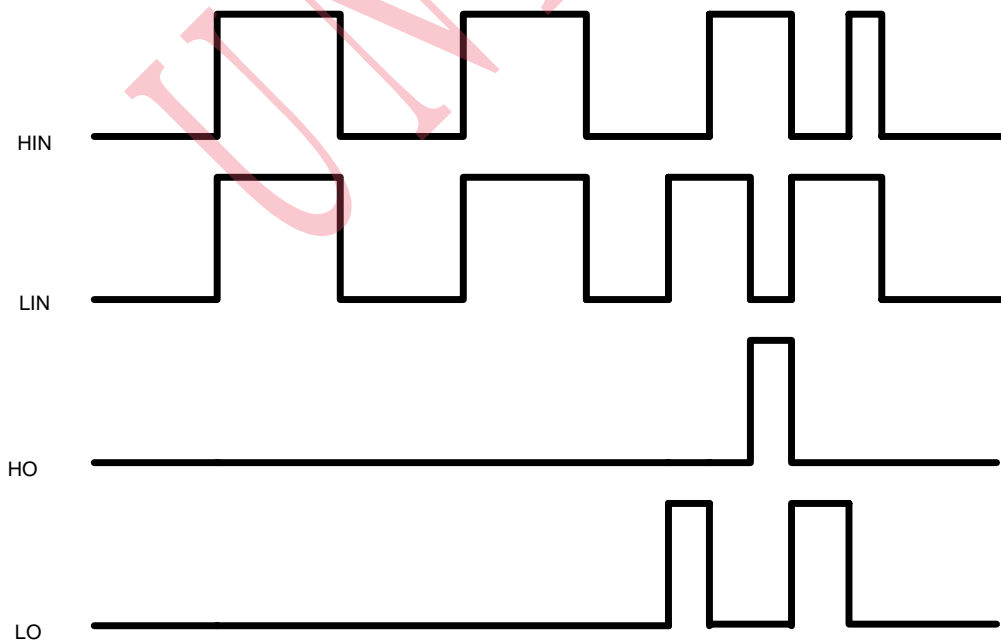
U3216
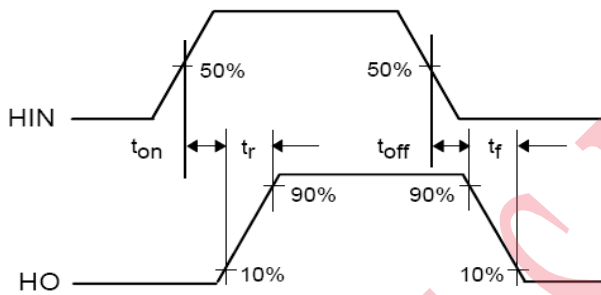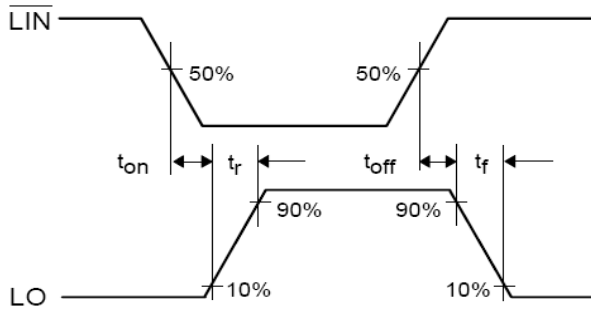
Switching Time Waveform Definitions

Delay matching time Definitions

Deadtime Waveform Definitions

Packaging information

SOP 8

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

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