

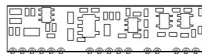
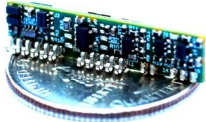
Universal Sequencers, Controllers, and Ultra-Fast Switches for GaN Transistors

XSYSTOR

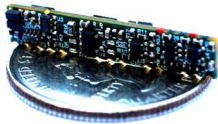
PRODUCT FLYER
July 2017

Brief Descriptions

ACTUAL SIZES



100X, 100T
200X, 200T



100L
200L

100 Series Controller takes in negative analog voltage for negative gate bias control (non-inverting).

200 Series Controller takes in positive analog voltage for negative gate bias control (inverting).



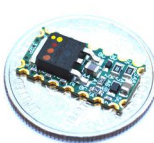
410X, 410T
420X, 420T
430X, 430T



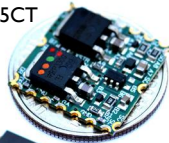
410L, 420L, 430L

400 Series Dual MOS Switch has two individual 8A switches or be made complementary as a Push-Pull.

332P
332N



335CT

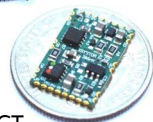
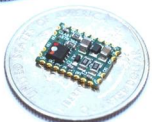


362P
362N



365CT

392P



395CT

300 Series Single or CMOS Switches come in 8A to 36A at 100V. Complementary switches have extremely fast switching times.

Controller Features

- Protects GaN devices from any power sequence of voltage supplies.
- Internal Negative voltage with 30mA OR external supply for 100mA boost.
- Bias Voltage has Fixed Gate OR Pulsed Gate configuration.
- Simultaneous Gate-Drain sequencing OR Independent Gate/Drain control.
- TTL OR Open Drain (<300mA) output drive for MOSFET switches.
- Temp compensation from local OR remote temp sensor feedback.
- >25dB EMI/RFI Rejection at all I/O ports except from auxiliary taps.
- <500 nsec total delay from V_Logic to V_Drain with applicable switch.
- Option Term Pins: 50 mil pitch [1.27 mm]. Low Profile: 60 mil [1.52 mm]. X is standard configuration.
- RoHS* Compliant

Want a faster way to combine the Controller and Switch? Check out our Drop-In Eval Boards....600E & 700E Series!

MOS Switch Features

- Rated for 100V
- Ultra-low R_{ds} ON
- Operation up to 125°C, with derated voltage and current.
- CW and Pulsed versions available.
- 400 Series are Ideal for 2-stage amps, balanced amps, and single GaN with critical rise and fall times.
- Complementary P & N-channel MOS achieve Rise, Fall, or Propagation Times of <<200ns.
- Total switching times of <500 nsec when used together with 100 or 200 Series GaN Controllers.
- Specify CW or average current use at less than 50% of the peak current.
- Identical I/O Ports at opposite sides of the module.
- RoHS* Compliant

Controller Snapshot Specs

Parameter	Min	Max
Supply (+) Voltage	+20 V	+65 V
Supply (-) Voltage, Optional	-6 V	0 V
TTL Logic Voltage High	+3.6 V	+5.0 V
TTL Logic Voltage Low	0 V	+1.4 V
Internal (-) Supply V _G , Gate Pinchoff	-4.3 V	
Internal (-) Supply I	-30 mA	
Gate Bias Voltage Range	-4.3V	-0.5 V
Output ON Prop Delay (T _{Delay 1})		120 ns
Output ON Fall Time (T _{Fall 1})		120 ns
Output OFF Prop Delay (T _{Delay 5})		80 ns
Output OFF Rise Time (T _{Rise 3})		80 ns
Gate ON Prop Delay (T _{Delay 3})		160 ns
Gate ON Rise Time (T _{Rise 2})		60 ns
Gate OFF Prop Delay (T _{Delay 4})		160 ns
Gate OFF Fall Time (T _{Fall 2})		60 ns
Operating Temperature	-40°C	+85°C

MOS Switch Snapshot Specs

Parameter	Min	Max
Source Voltage (SO)	+20 V	+65 V
Drain Voltage (DR)	+20 V	+65 V
Gate Voltage (GI) Open Drain	0 V	+20 V
Gate Voltage (GA) TTL High	+2.0 V	+5.0 V
Gate Voltage (GA) TTL Low	0 V	+0.8 V
R _{ds} ON (12 A Switch)		0.22 Ω
R _{ds} ON (36 A Switch)		0.07 Ω
Turn-ON Prop Delay (T _{Delay 2})		100 ns
Turn-ON Rise Time (T _{Rise 1})		70 ns
Turn-OFF Prop Delay (T _{Delay 6}) Complementary Pair Only		150 ns
Turn-OFF Fall Time (T _{Fall 3})		100 ns
Period for Pulsed Signals		5 ms
Duty Cycle for Pulsed Signals		20 %
Operating Temperature	-40°C	+85°C

Propagation Delay is measured from 90% of Drive Signal from Controller to 10% of Drain Voltage Output with load of 1KΩ. Faster speeds occur with decreased load resistance. Rise/Fall Times are measured at 10% and 90% of signal. Both measurements are summed for total time.

Application Examples

Figure 1

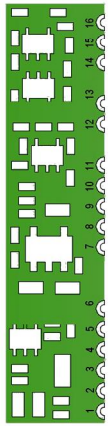
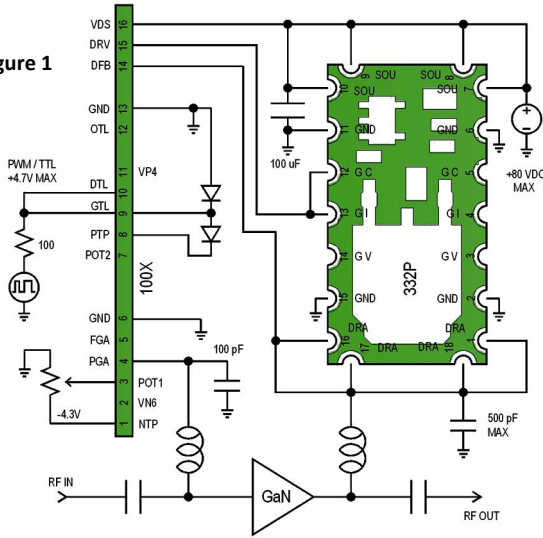


Figure 2

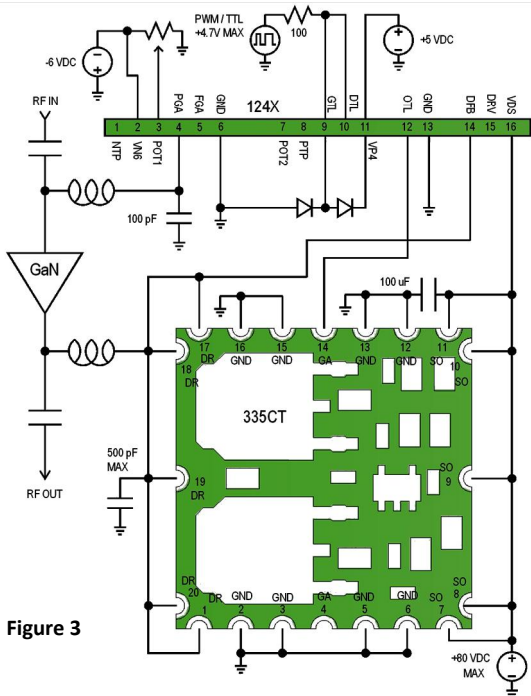
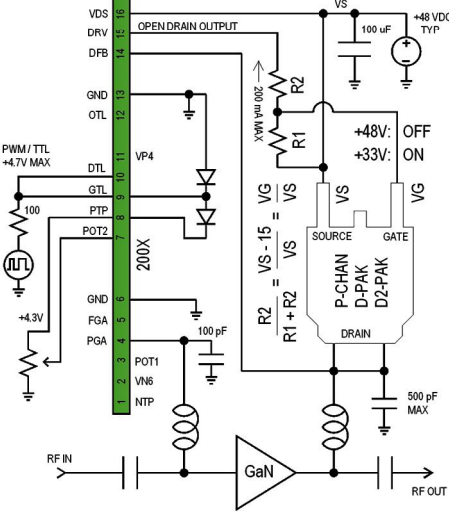
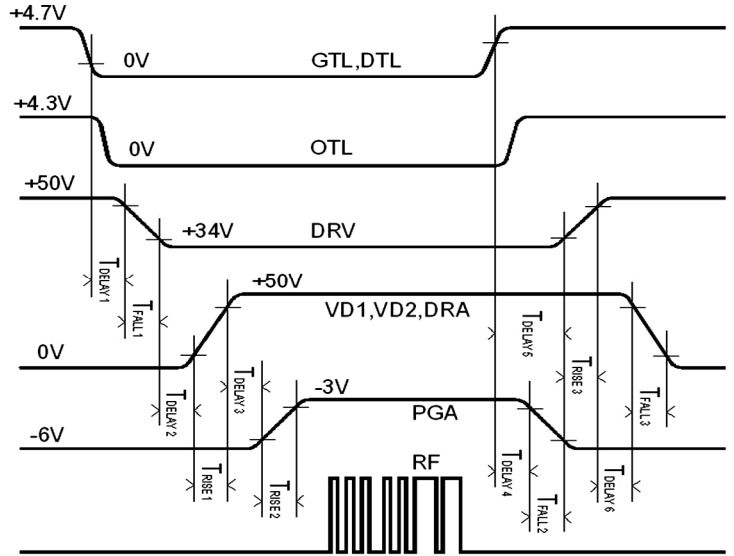


Figure 3

Typical Timing Diagram



Refer to Application Note XAN-2 for further details.

Figure 1. A non-inverting controller, 100X, drives a MOS switch 332P for a pulsed-mode GaN amplifier. A single voltage source is used to power up all components.

Figure 2. Controller 200X, drives a general purpose PMOS for CW operation. A single power source is used as well. The switch consists of one transistor with a pair of resistors.

Figure 3. The power CMOS 335CT is controlled by the 124X basic sequencer with -6VDC external supply to boost current for gate bias. This configuration provides a faster (<200nsec) and structured rise and fall times for a well controlled spectral characteristic.

Figure 4. A typical controller driving a 410X dual switch for a 3-stage GaN amplifier. Buffer circuits for gate ensures non-interference for sensitive bias levels.

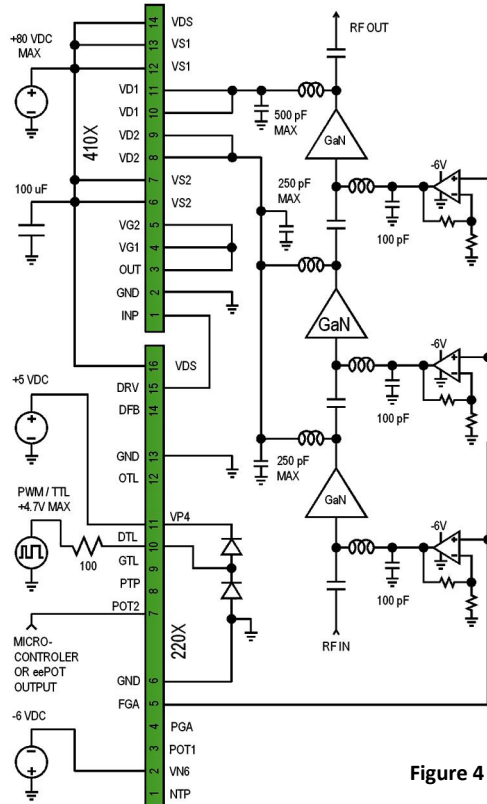


Figure 4