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NCP51561 Isolated Gate Driver

5 kV RMS Isolated
Dual Channel Gate Driver
with 4.5A source/9A sink

Public Information

NCP51561 – 5 kV Isolated High Speed Dual MOS/SiC Gate Drivers

Value Proposition

The NCP51561 is an isolated dual-channel gate driver with up to 4.5-A/9-A source and sink peak current. It is designed for fast switching to drive power MOSFETs power switches. The device offers short and matched propagation delays. Internal functional isolation between the two secondary-side drivers allows a working voltage of up to about 1,200 VDC. The NCP5156x offers other important protection functions such as independent under-voltage lockout for each drivers and disable function.

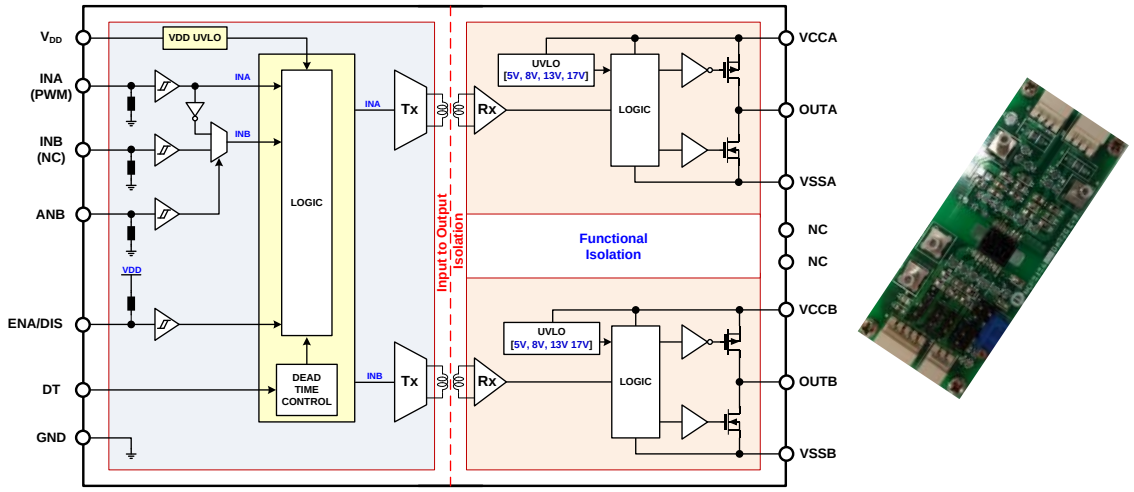
Unique Features

- Input side isolated from output drivers by 5-kVRMS isolation barrier
- 36 ns Prop Delay & 8 ns Delay Match
- Higher than 150 V/ns dV/dt Immunity
- 4.5A Typical Source Current Capability
- 9A Typical Sink Capability

Benefits

- Highly reliable operation and safety
- Efficient switching, low losses
- High Robustness
- Driver to accommodate differential MOS load

Typical Application Diagram



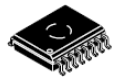
Other features

- User Programmable Input Logic
  - Single or Dual-input modes via ANB
  - DISABLE or ENABLE mode
- User Programmable Dead-Time Control
- Different UVLO options: 8-V & 17-V (5 & 13 V On demand)

Market & Applications

- Isolated Converters in Offline AC-DC Power Supplies
- Motor Drive and DC-AC Inverters
- HEV and EV On-Board chargers
- Server, Telecom, and Industrial Infrastructures
- UPS & Solar Inverters (SJ or SiC Mosfets)

Ordering information and packaging



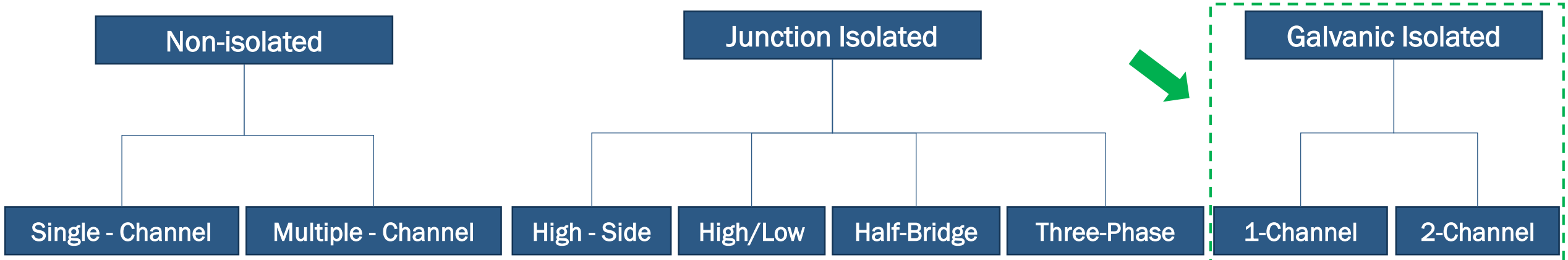
SOIC–16 WB
CASE 751G–03

Part Number	Operating Temp	Package
NCP51561xyDWR2G	(-40 ; 125) [°C]	SOIC-16 WB

- x: UVLO level
- y: Enable/Disable

Public Information

Gate Driver technology selection guide & NCP51561



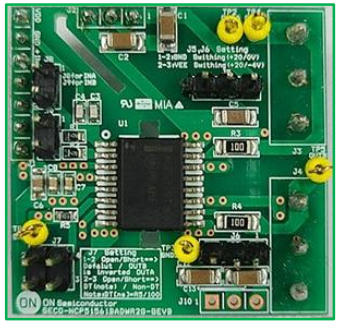
Non-isolated		Junction Isolated				Galvanic Isolated	
• Single or multiple channel • Cheapest, simple solution for many applications where only a low-side driver is needed		• High Side, High/Low and Half Bridge • Floating HV well • From LV to 1200V breakdown voltage				• Normally needed in very high power/high voltage systems. • Three options: Optical, Inductive, Capacitive	
Applications							
• Automotive • Industrial Systems • Consumer Devices		• Appliances • Consumer Devices & Power Tools • Auxiliary Automotive & Motors Drives • Offline Power				• Automotive traction inverters • Industrial Drive • Server Rack Power • Solar and Energy Storage	
Products							
FAN3111 FAN3100 FAN3181 FAN312x	FAN321x FAN322x	FAN73611	FAN8811 FAN7392 NCP51530 NCP5183	FAN7382 FAN73833 FAN73912 NCP5106B	FAN7382 FAN73833 FAN73912 NCP5106B	NCD5708x NCP5115x NCP5175x	NCD5725x **NCP5156x**

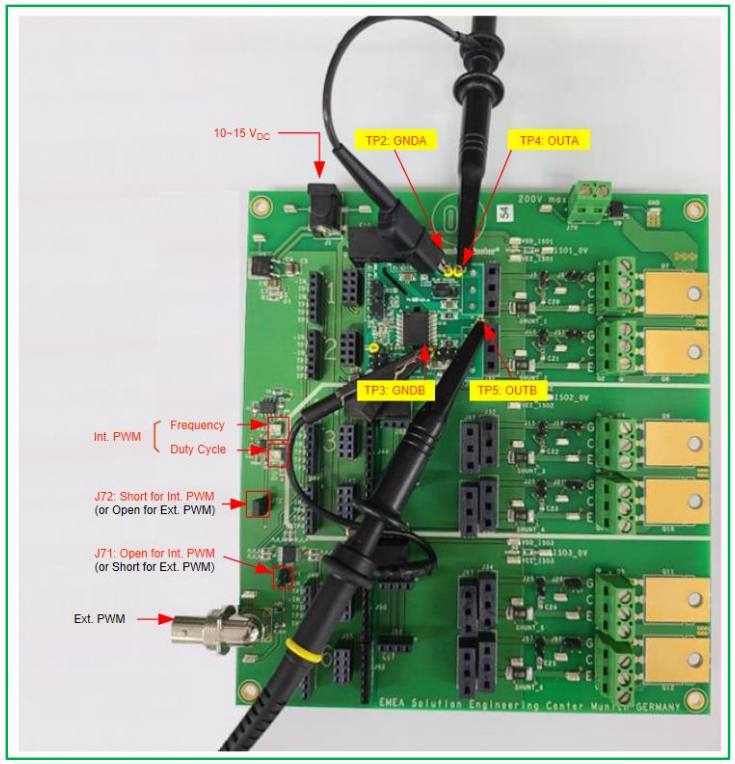
Isolated Drivers Selection Guide

OPN	Features										Target Applications								
											Automotive				Industrial 4.0				
	No. of channels	Isolation	Primary use	Differential Input	Split output	DESAT w/ FLT	Miller Clamp	Neg Charge Pump	Gate Clamp	I2C	Traction	PTC	OBC	HV DC-DC	UPS	Solar	Motor Control	Telecom	Server
NCP51561A/BxDW	2	5 kV	MOS	✓													✓	✓	✓
NCP51561C/DxDW	2	5 kV	SiC	✓											✓	✓	✓		
NCP51560BxDW	2	5 kV	MOS	✓													✓	✓	✓
NCP51563A/BxDW	2	5 kV	MOS	✓											✓	✓	✓		
NCV51561A/BxDW	2	5 kV	MOS	✓									✓	✓					
NCV51561C/DxDW	2	5 kV	SiC	✓							✓	✓	✓	✓					
NCV51563A/BxDW	2	5 kV	MOS	✓									✓	✓					
NCV51563C/DxDW	2	5 kV	SiC	✓							✓	✓	✓	✓					
NCP51566BxDW	2	5 kV	MOS	✓									✓	✓		✓		✓	✓
NCP51567CxDW	2	5 kV	SiC	✓											✓	✓	✓		✓
NCP51752xDW	1	5 kV	SiC	✓	✓			✓							✓	✓	✓	✓	✓
NCV51752xDW	1	5 kV	SiC	✓	✓			✓			✓		✓	✓					
NCP51157xDW	1	5 kV	MOS	✓	Y/N										✓	✓	✓	✓	✓
NCV51157xDW	1	5 kV	MOS	✓	Y/N						✓	✓	✓						
NCP51152xD	1	3.7 kV	MOS	✓	Y/N										✓	✓	✓	✓	✓
NCV51152xD	1	3.7 kV	MOS	✓	Y/N						✓	✓	✓						
NCV51567CxDW	2	5 kV	SiC	✓	✓						✓	✓	✓	✓					
NCP51861xDW	2	5 kV	GaN	✓														✓	✓
NCP51866xDW	2	5 kV	GaN	✓	✓				✓									✓	✓
NCP51755xDW	1	5 kV	SiC	✓	✓	✓	✓	✓		✓					✓	✓	✓		
NCV51755xDW	1	5 kV	SiC	✓	✓	✓	✓	✓		✓	✓		✓	✓					
NCV51568BxMN	2	2 kV	MOS	✓														✓	✓

NCP51561 & Gate Driver Ecosystem for rapid Testing/Prototyping

- The SECO-NCP51561BADWR2G-GEVB is an evaluation board for the NCP51561 5kV RMS isolated dual channel gate driver.
- The board includes all the necessary driver circuit and it can be used directly on an application or plugged into the SECO-GDBB-GEVB gate driver ecosystem board for a quick-start evaluation the gate driver.





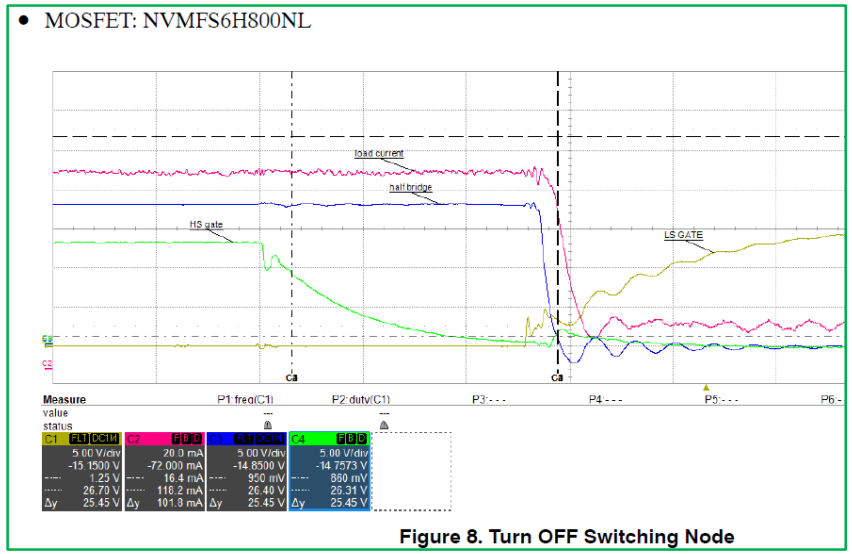


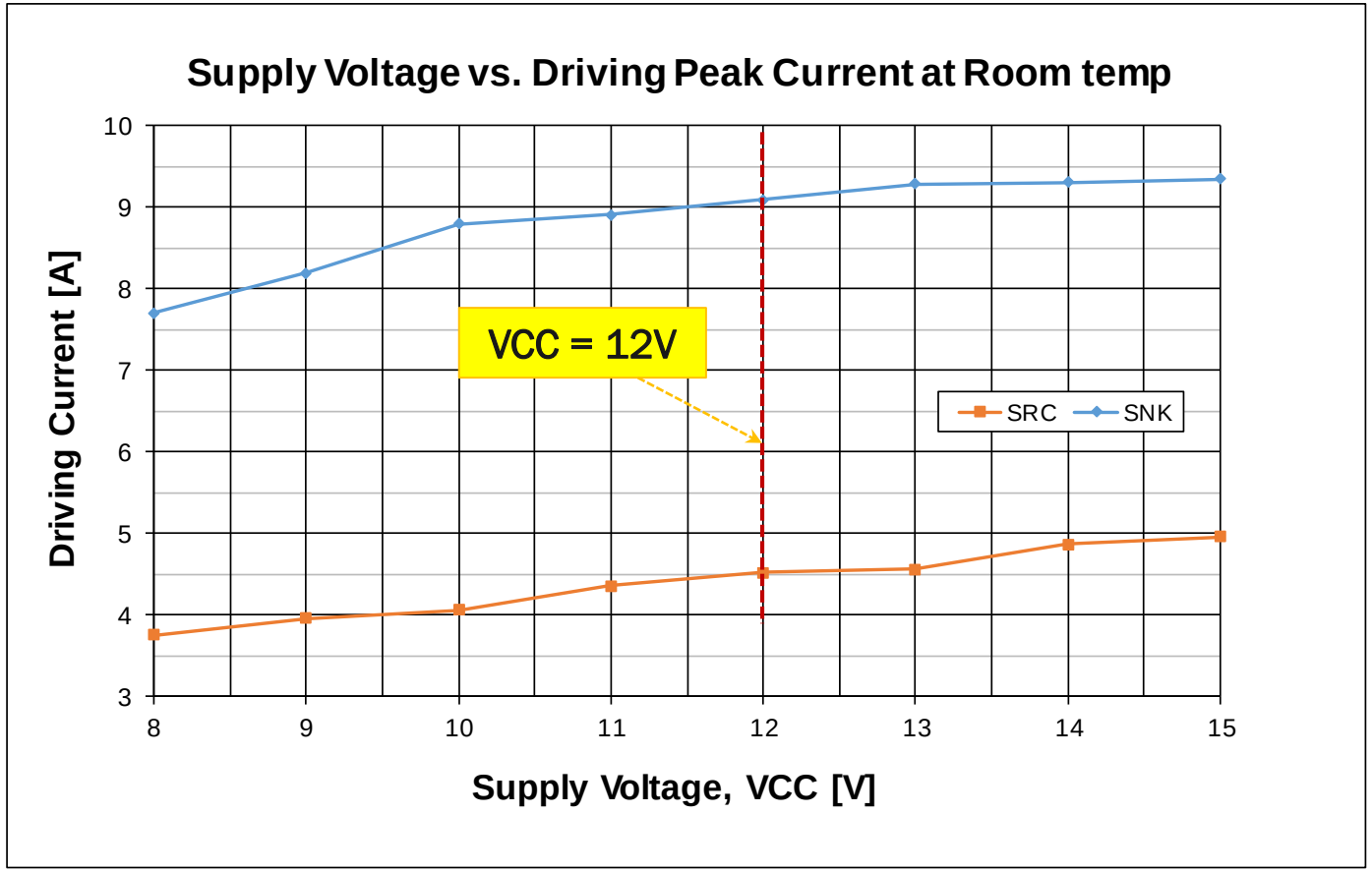
Figure 8. Turn OFF Switching Node

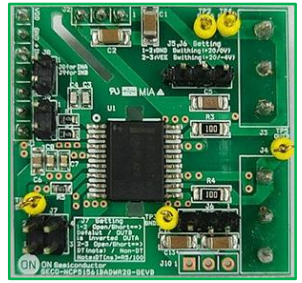
Detailed System Guide Here

NCP51561 – Gate Drive OUTPUT Source/Sink Currents

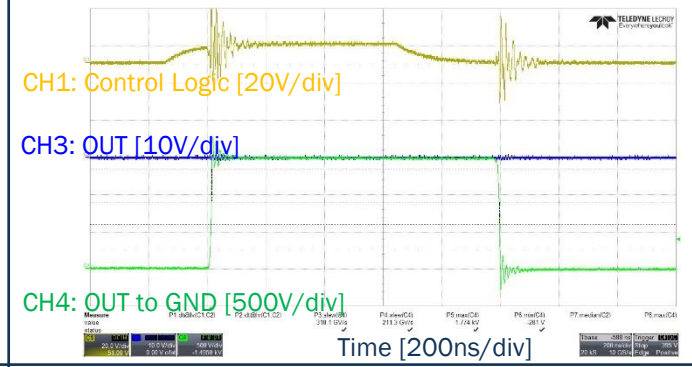
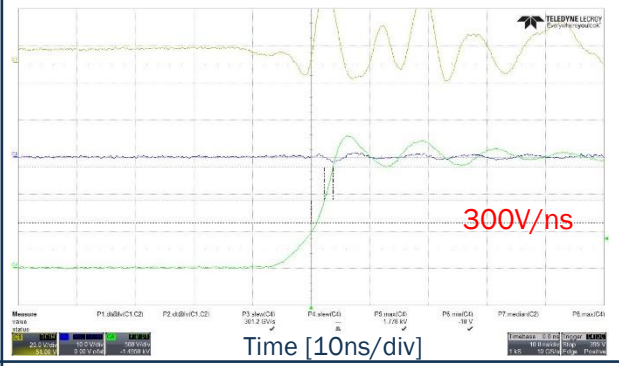
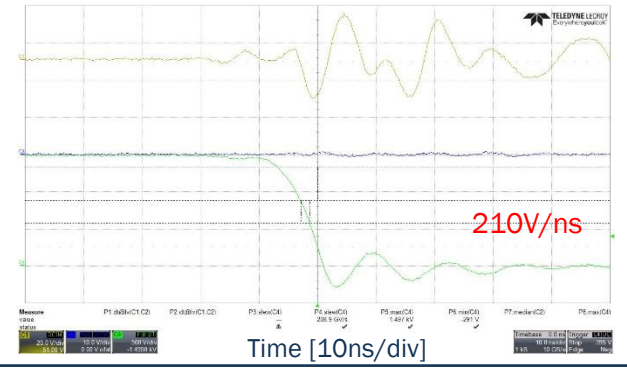
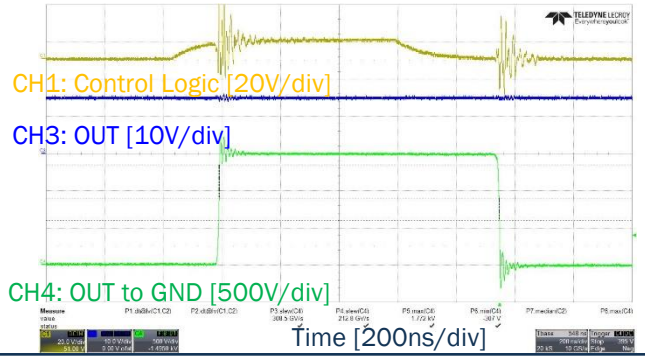
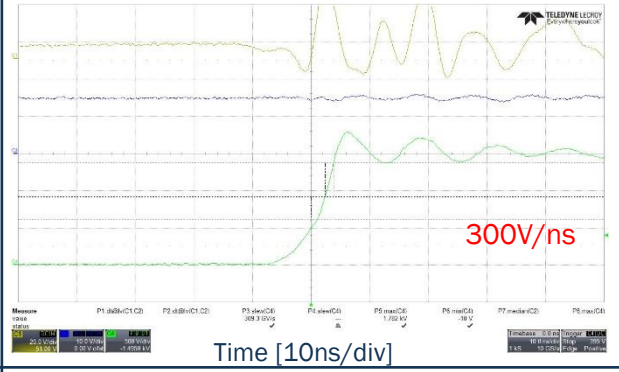
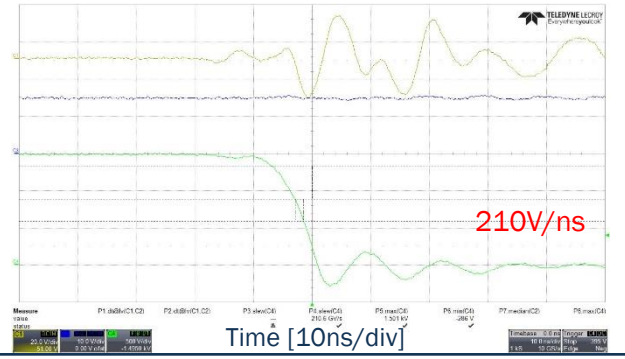
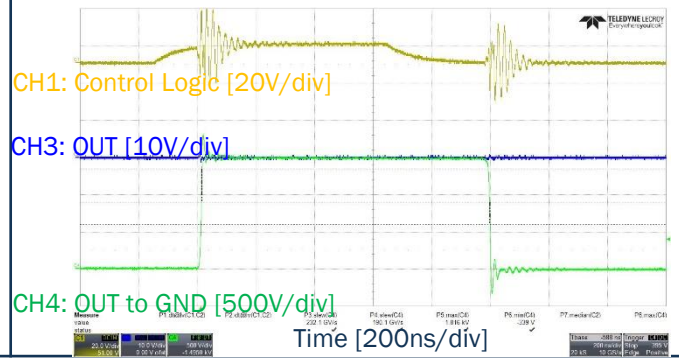
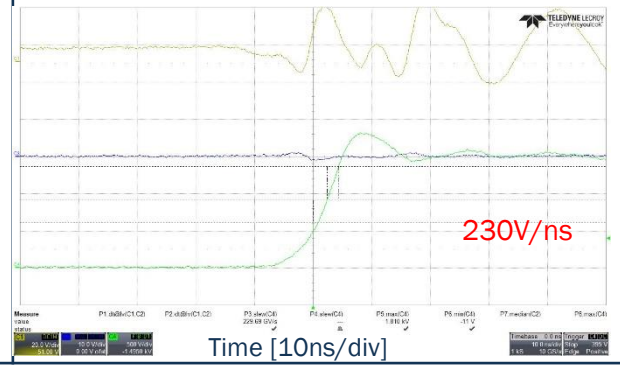
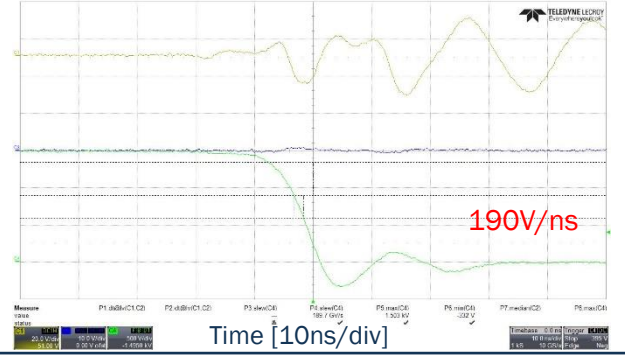
Very High Source and Sink Current Capability

- Real life test results indicate a peak source around 4.52 A and 9.09 A respectively at VCC=12V @room temperature
- Output peak source and sink target specification for the same conditions are typically 4 A and 8 A respectively





NCP51561 – Outstanding Common Mode Transient Immunity (CMTI)

Load Cap	IN	Full Waveform	Rising	Falling
0	Low			
	High			
22 pF	Low			

Immunity By Capacitive Load @ HV source = 1.5kV

(※ All waveform is referenced to VSS)