

Tektronix

IsoVu Gen 2 Isolated Probes

Greater Performance, Smaller Size, Easier to Use

23 OCTOBER 2020



Market and Applications

The background of the slide is a gradient of blue and teal colors. It features several abstract geometric elements: a large, light blue parallelogram shape on the right side, a smaller, darker teal parallelogram below it, and a central area with a fine dotted pattern. The overall design is modern and professional.

Power Conversion

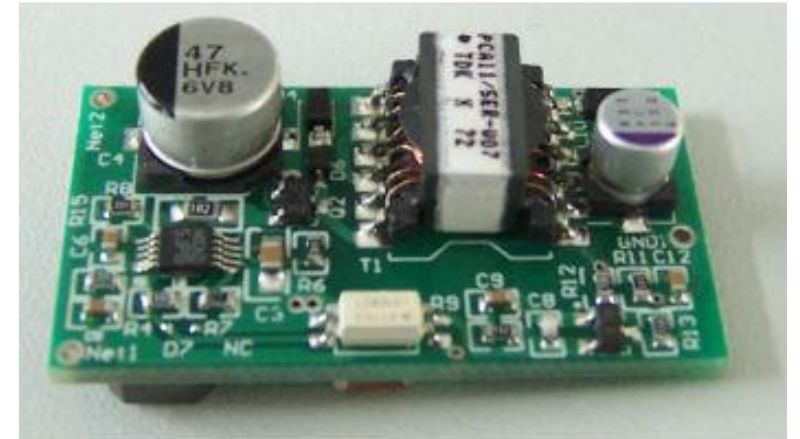
EFFICIENCY & DENSITY DRIVE DESIGN WINS FOR WIDE BANDGAP



Floating Measurements: Power Converters

ISOVU APPLICATION

- Industries
 - Power Conversion, Lighting, Solar, Consumer, Computers, Automotive, Industrial, mil/gov, etc.
- What they make
 - Silicon, modules, end products
- What they want to see
 - Control signals on switch-mode power supplies
 - Current measurements across shunt resistors
- Their challenges
 - Devices are not grounded, grounding through the scope would cause failures
 - Common mode interference from switching completely distorts the measurement



Differential Signals in Noisy Environments

ISOVU APPLICATION

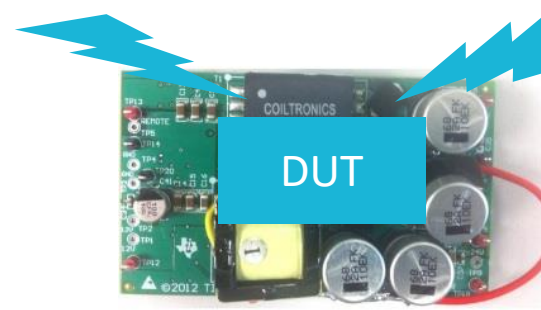
- Industries
 - Automotive, industrial, mil/gov, etc.
- What they make
 - Silicon, modules, end products
- What they want to see
 - Signals running on un-grounded buses, usually between boards or modules
- Their challenges
 - Devices are not grounded, grounding through the scope introduces errors
 - Outside noise appears as common mode, interfering with measurements



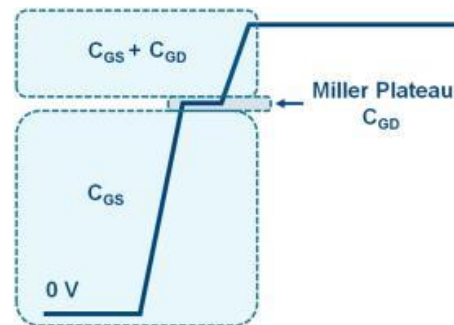
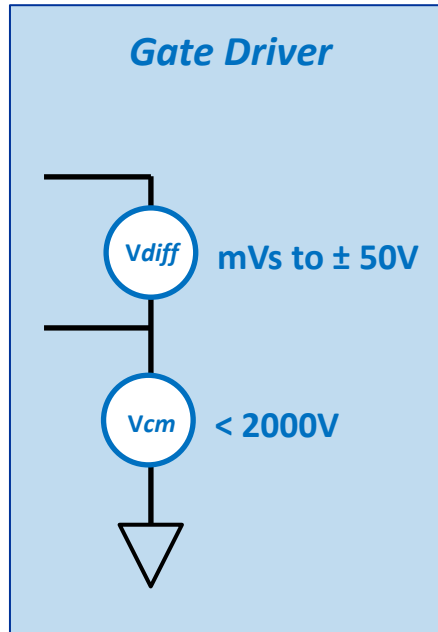
EMC Testing & Troubleshooting

ISOVU APPLICATION

- Industries
 - Almost everyone!
- What they make
 - Modules, end products
- What they want to see
 - Their products operating while the products are under electrical stress
- Their challenges
 - The test sources of electrical stress (surges, transients, EMI) interfere with measurements
 - Can't tell if signals are from their product or noise coupling into the leads
 - Need separation (distance) from radiated emissions, electrical isolation, bandwidth



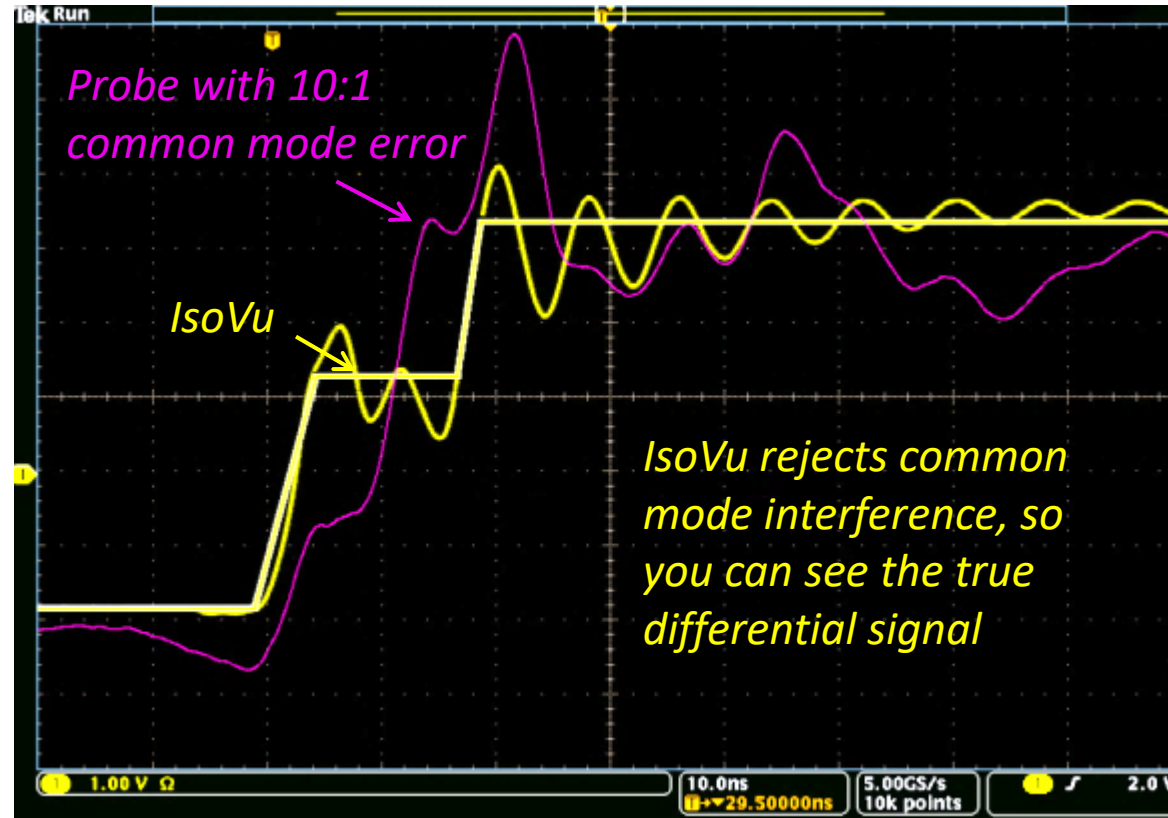
The Challenge: Designing “Blind”



Engineers are forced to rely on simulation, workarounds, or inferences (forced to measure to ground)

Do Your Measurements Match Your Expected Results?

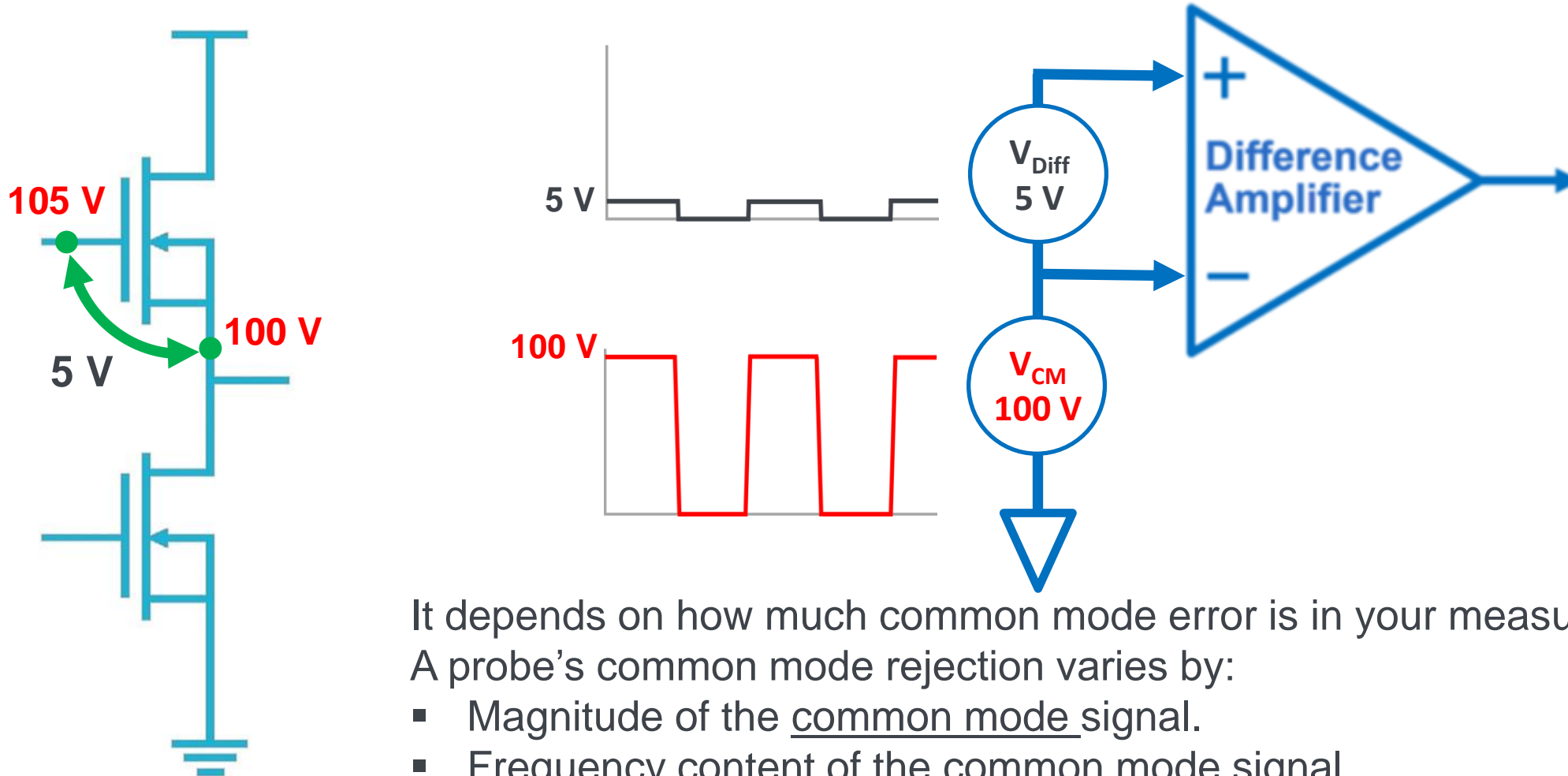
- IsoVu gives you an accurate, repeatable measurement providing meaningful correlation with expected performance



The Measurement Problem

CMRR IS A CRITICAL BUT OFTEN OVERLOOKED SPECIFICATION

Can a 5V differential signal be measured in the presence of 100V common mode signal?



It depends on how much common mode error is in your measurement.

A probe's common mode rejection varies by:

- Magnitude of the common mode signal.
- Frequency content of the common mode signal.

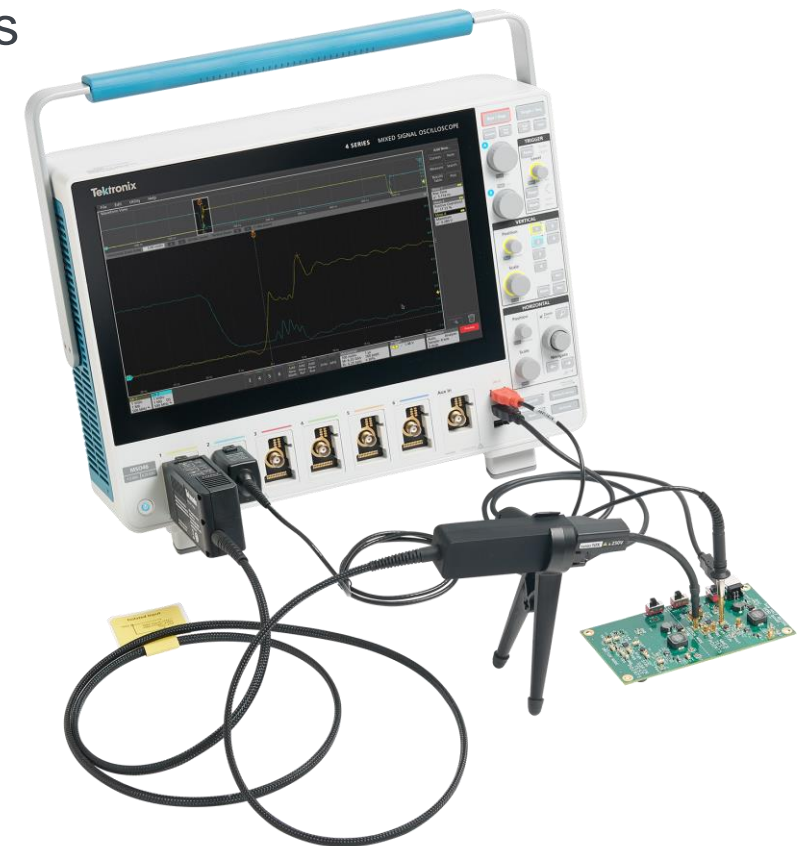
What is IsoVu™ Technology?

ISOLATED - DIFFERENTIAL MEASUREMENT SYSTEM

IsoVu™ technology is the **ONLY** differential probing system for Wide Bandgap (WBG) testing!

Enables differential measurements on floating, fast (~1ns) signals

- New Differential Probes characteristics:
 - High Common Mode Rejection (CMRR)
 - High Bandwidth
 - Wide Input range
 - Max Flexibility
- Up to **±2500V** input range
- Up to **60kV CM**
- Up to **1GHz (<350ps rise time)**
- Up to **100dB CMRR @100MHz**



Customer Success

SIC SEMI-CONDUCTOR DESIGN



- Cam Pham – Global Automotive FAE Leader

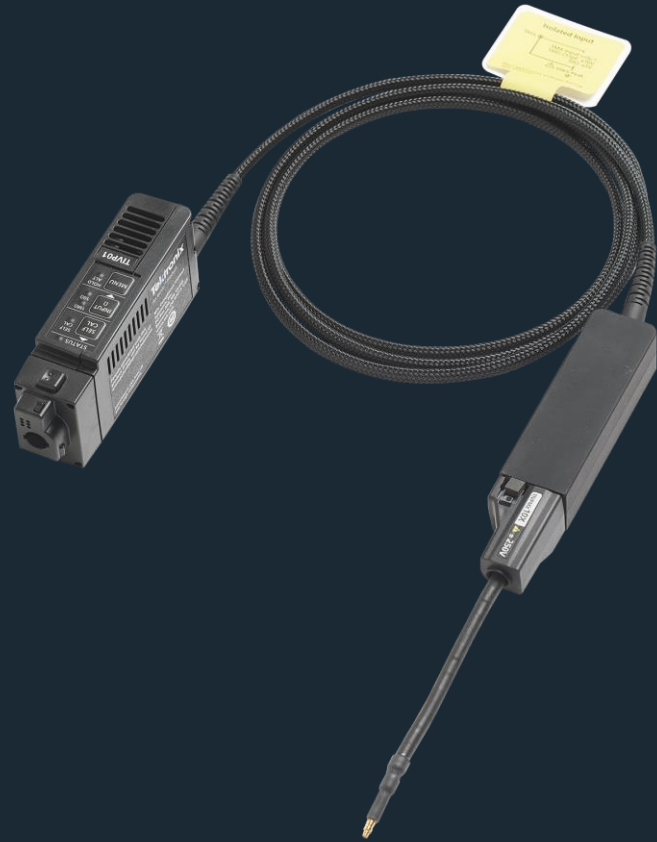


“IsoVu technology has been critical in our support of customers adopting our Power Conversion technology in their designs.” says Cam Pham, Global Automotive Field Application Engineer Leader, Wolfspeed, a Cree Company. “With its galvanic isolation capability, IsoVu technology enables us and customers to accurately characterize high side events with confidence”

“What I have witnessed in the field when I bring my TiVH (or loan from demopool), it does not only enable me, but also our customers, thus this also serve as an invitation to new customers of Tek. Again, “...for the engineer”,

The fiber optic isolation from IsoVu really stands out from competition, also the channel cross talk/immunity etc. and both will agree it is a darn good technology; superior, state of the art!”

IsoVu Gen 2 Isolated Probing System



Industry Firsts!

- 1 Only 1 GHz Isolated Probe on Market
- 2 Smallest size to improve DUT accessibility
- 3 Best CMRR in a Differential Probe

The Next Generation in IsoVu

STRENGTHENING LEADERSHIP IN ISOLATED PROBING

- **Easier Accessibility**
 - 1/5th size vs. TIVH
 - Controller box removed!
 - More affordable, starting at \$9k USD
- **More Accurate**
 - Improved gain accuracy
 - Flatter Frequency Response
- **Improved Sensitivity**
 - Less noise at sensitive measurements
- **More Convenient**
 - 4 tips vs. 7 tips on TIVH
 - Optimized for use on 4/5/6 Series MSO



Benefits of ALL IsoVu Probes

- Unbeatable CMRR
- Powered Over Fiber
- High Performance MMCX Connector
- Incredibly Low Loading
(10 M Ω || 2 pF)

TIVP vs. TIVH

COMPARISON FACT SHEET



Key Specifications Comparison

	Tektronix TIVP	Tektronix TIVH
Applications	High Side V_{GS} , Wide Bandgap (GaN and SiC) characterization, SMPS optimization, Temperature Testing (with SMA cable)	High Side V_{GS} , Wide Bandgap (GaN and SiC) characterization, SMPS optimization
Bandwidth	200 MHz, 500 MHz, 1 GHz	200 MHz, 500 MHz, 800 MHz
Risetime	450ps, 850ps, 2ns	450ps, 850ps, 2ns
CMRR @DC	160 dB	160 dB
CMRR @100 MHz	100 dB	100 dB
Diff. Voltage Range	Adjustable by Variable Gain. up to 3.3kV*	Adjustable by Tip Attenuation. up to $\pm 2.5kV$
CM. Voltage Range	$\pm 60kV$	$\pm 60kV$
Offset Voltage Range	$\pm 2.5kV$	$\pm 2.5kV$
Noise (200mV – 3V measurements)	41.8mV_{pp}	79.8mV _{pp}
DC Gain Accuracy	<2%	3%
Input Impedance	10 M Ω 3 pF	10 M Ω 2 pF
Tips Required from 0V – 2500V	4	7
Temperature Range	0°C - 50°C (Probe head) 0°C - 85°C (Probe tip cable)	0°C - 70°C (Probe head) 0°C - 85°C (Probe tip cable)
Oscilloscope Compatibility	4/5/6 Series MSO only	All TekVPI Oscilloscopes (including 4/5/6 Series MSO)

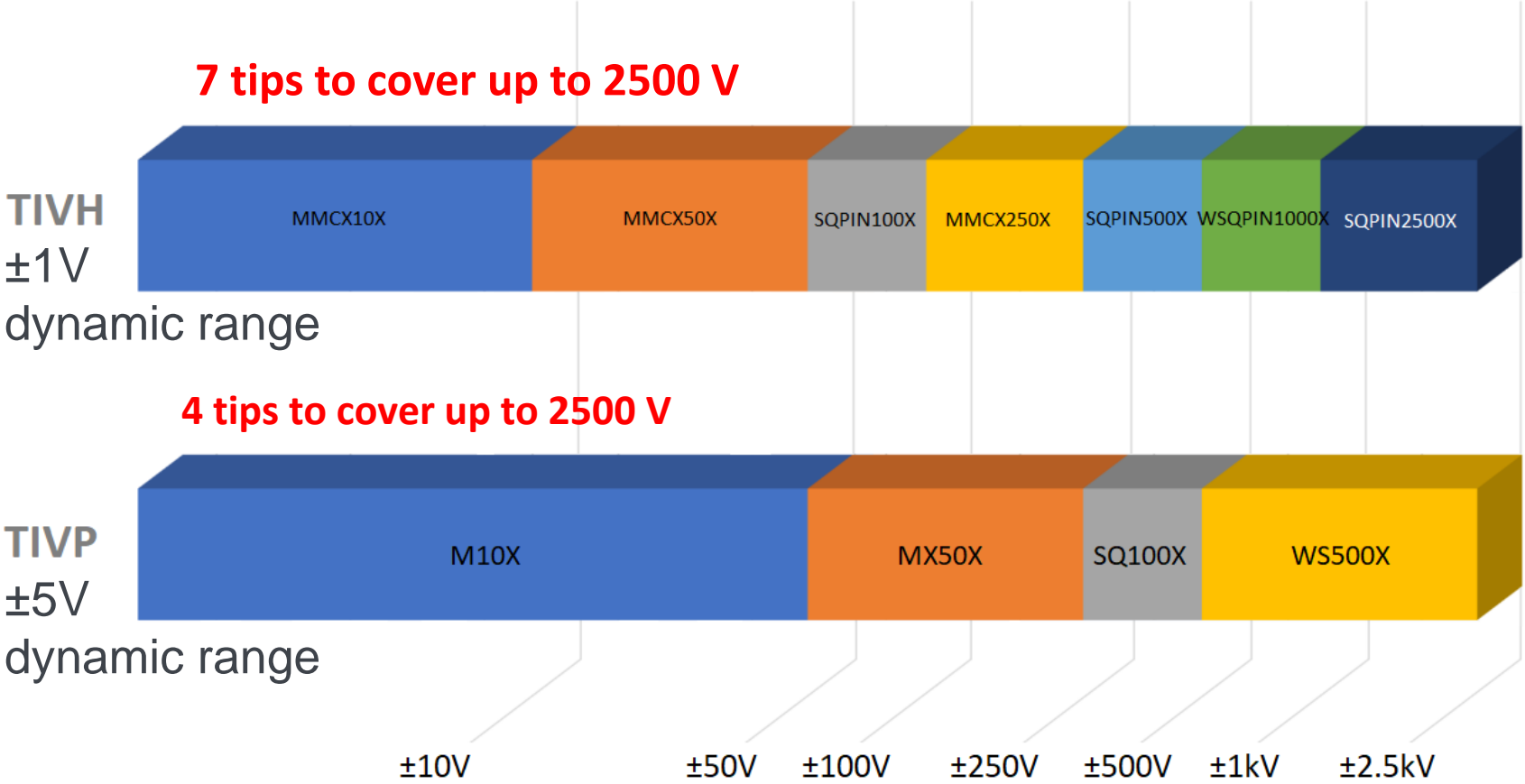
*preliminary data



IsoVu Gen 2 is 80% Smaller



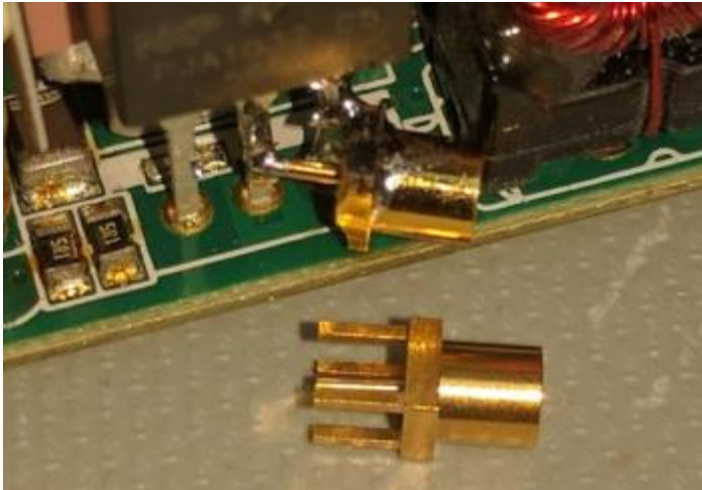
Probe Tip Inventory & Swapping is Minimized!



TIVP Probe Tips: MMCX Connectors (up to 250V)

DESIGNED FOR OPTIMAL PERFORMANCE AND CONVENIENCE

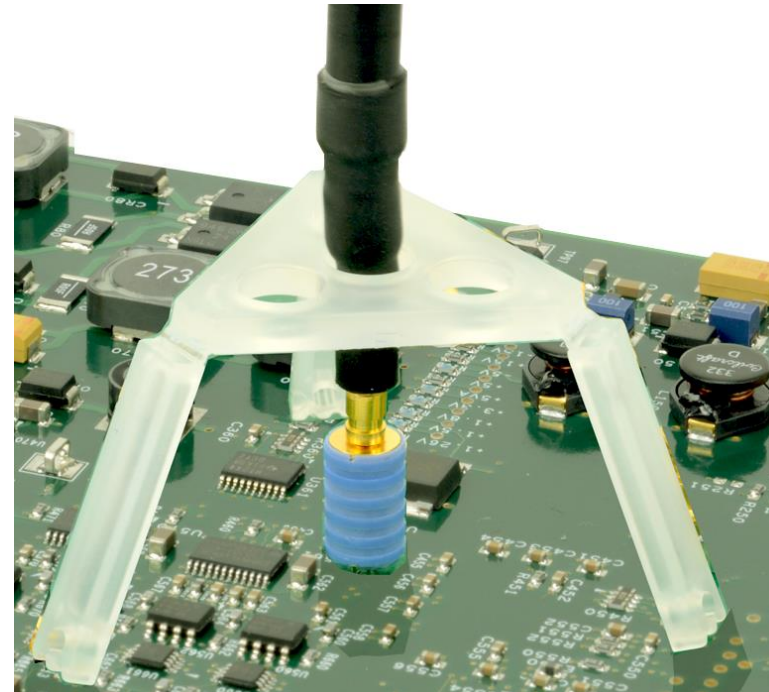
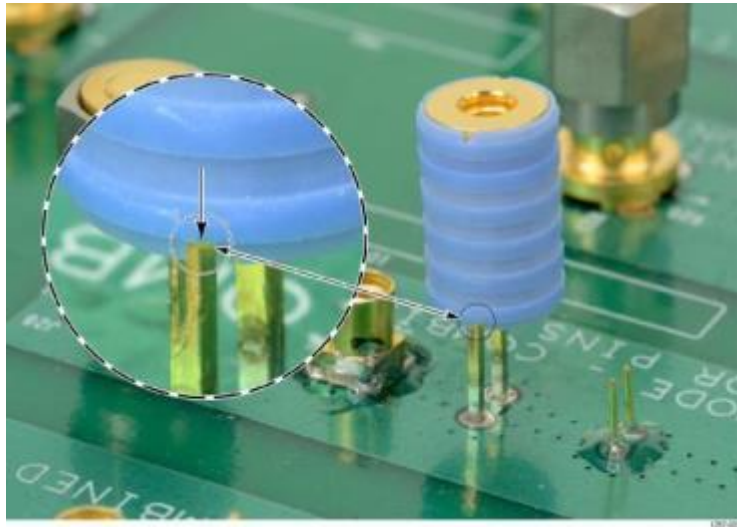
- Planned test points (MMCX Connectors) → Best Performance
 - MMCX connectors are small, inexpensive (typically <\$2) and come in a variety of packages that can be purchased from Digi-key or other vendors. They can be soldered onto unplanned test points.



TIVP Probe Tips: Square Pin to MMCX Adapter

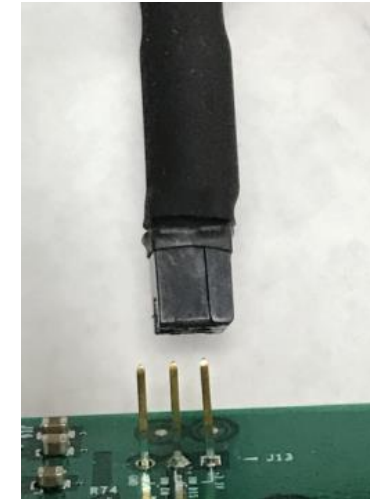
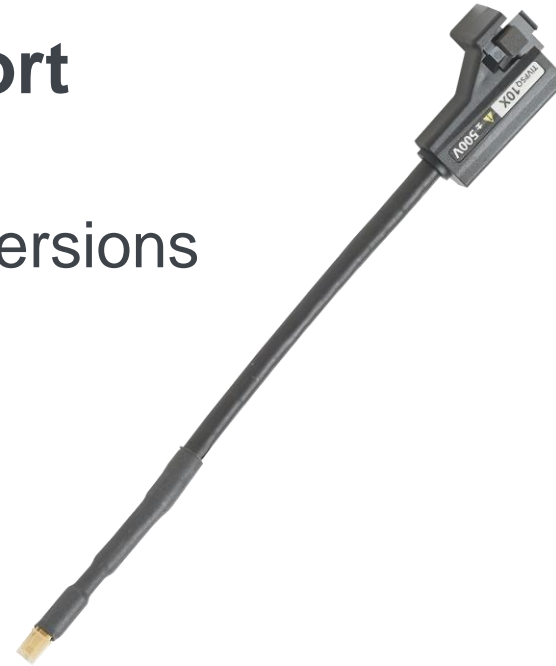
ISOVU SUPPORT FOR UNPLANNED TEST POINTS

- Square Pin to MMCX Adapter
 - High performance square pin adapter designed to minimize the performance impact of the square pins



TIVP Probe Tips: Square Pin Support

- Square Pin Probe Tip Cable – two versions
 - 0.1" (2.54 mm) pitch up to 600V
 - 0.2" (5.08 mm) pitch up to 2500V



Ordering Information



IsoVu Gen 2 Ordering Information

BASE PRODUCTS

Product		Description	US MSRP	Bandwidth	Differential Voltage	Cable Length
Probe	TIVP02	200 MHz probe with standard accessory kit	\$9,000	200 MHz	±5V	2 Meters
	TIVP05	500 MHz probe with standard accessory kit	\$17,000	500 MHz	±5V	2 Meters
	TIVP1	1 GHz probe with standard accessory kit	\$24,700	1 GHz	±5V	2 Meters
	TIVP02L	200 MHz probe with standard accessory kit	\$13,000	200 MHz	±5V	10 Meters
	TIVP05L	500 MHz probe with standard accessory kit	\$20,500	500 MHz	±5V	10 Meters
	TIVP1L	1 GHz probe with standard accessory kit	\$28,200	1 GHz	±5V	10 Meters
Tips	TIVPMX10X	MMCX 10X Tip Cable (short)	\$1,000		±50V	
	TIVPMX50X	MMCX 50X Tip Cable (short)	\$1,000		±250V	
	TIVPSQ100X	SQPIN 100X Tip Cable (short)	\$1,000		±500V	
	TIVPWS500X	WSQPIN 500X Tip Cable (short)	\$1,000		±2500V	
	TIVPMX1X	MMCX 1X Tip Cable (short)	\$1,000		±5V	

standard accsy.

Цены приведены без учёта налогов и пошлин.



TIVP Accessories

- Standard Accessories

MMCX probe tip

The 10X MMCX tip is included in every TIVP probe. The MMCX tip is recommended for the best bandwidth and CMRR performance. 0.100" Square Pin and 0.200" Wide Square Pin tips are available as optional accessories. Reorder part number: **TIVPMX10X**



Probe bipod

Used to hold probe. TIVP can rotate in holder to accommodate square pin headers. Reorder part number:

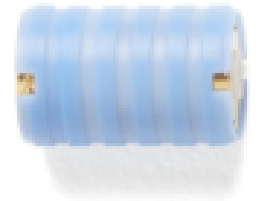
352-1179-xx



Probe tip adapter

Adapt an MMCX IsoVu tip to standard 0.100" spaced, 0.025" square pins. Reorder part number:

131-9717-xx



SMA wrench/driver tool

5/16" wrench for use on SMA connector. Reorder part number:

003-1947-xx



IsoVu carrying case

Soft case (with foam insert) protects the TIVP and enforces the optical fiber minimum bend radius. Reorder part number:

016-2147-xx



TIVP Accessories

- Optional Accessories

50X MMCX sensor tip

TIVPMX50X



100X sensor tip cable with 0.100" spaced square pin connectors

TIVPSQ100X



500X sensor tip cable with 0.200" spaced wide square pin connector

TIVPWS500X



1X MMCX sensor tip

TIVPMX1X



Square Pin to MMCX Adapter,
0.062" Spacing

131-9677-xx



Probe Tip Tripod Support

352-1170-xx



Lead, MMCX to IC Grabber

196-3546-xx



Lead, Square Pin to IC Grabber

196-3547-xx



Lead, Wide Square Pin to Banana Jack

020-3189-xx



MMCX Y-Lead

TPR4KIT



Square Pin Y-lead

196-3434-xx



MicroCKT grabbers

206-0569-xx



Spare Pins for 0.062" Spaced Test Points

020-3169-xx



Solder Aid for 0.062" Spaced Square Pins

003-1946-xx

