

# Upgrade Your Design

**New Packages**  
**More Features**  
**Better Performance**

- Optocouplers
- Industrial Fiber
- Encoders



# BROADCOM® Optocouplers / Safe Isolation

Competitor Parts	Existing Parts	Upgrade Part	Upgrade Features	Footprint Information
<b>Gate Drive</b>				
TLP358F TLP350F FOD3120T PS9552L1/L2	HCNW3120 ACNV3190 ACNV3130	ACNW3430 ACNW3410 ACNU-3430 ACNU-3410	<ul style="list-style-type: none"> <li>• Up to 5A max. peak output current</li> <li>• Very High CMR (100kV/μs)</li> <li>• UVLO with VE reference for negative power supply</li> <li>• Low Propagation Delay (&lt;150ns)</li> <li>• 40% smaller 11mm S508 package (ACNU)</li> </ul>	Pin layout change Smaller footprint
Optical: TLP350, TLP5754 FOD3120, PS9552, PS9505, V03120 LTV-3120, LTV343W Alternative: TED160x12AF, Si823x*, Si826x, ADuM7223*	ACPL-T350 ACPL-J313 ACPL-J312 HCPL-3120 HCPL-3180 ACPL-H312/K312	ACPL-H342/ACPL-K342 ACPL-P341/ACPL-W341 ACPL-P343/ACPL-W343 ACPL-W346/ACPL-P346 ACPL-P349/ACPL-W349	<ul style="list-style-type: none"> <li>• Rail-to-Rail output voltage</li> <li>• Integrated Active Miller Clamp (ACPL-x342)</li> <li>• Lower Propagation Delay</li> <li>• Anti-Cross conduction</li> <li>• Very High CMR (up to 50kV/μs)</li> </ul>	Smaller footprint
Optical: TLP351, TLP701/705, TLP5701, FOD3181, FOD8314, PS9506, PS9306 Alternative: Si823x*, Si826x	HCPL-0302 HCPL-0314 HCPL-J314 HCPL-3150/3140 HCPL-315J/314J* ACPL-P302/W302 ACPL-P314/W314	ACPL-P340/ACPL-W340 ACPL-P345/ACPL-W345 ACPL-P347/ACPL-W347	<ul style="list-style-type: none"> <li>• Rail-to-Rail output voltage</li> <li>• Low Propagation Delay (&lt;200ns)</li> <li>• 50% smaller package size</li> <li>• 8mm Creepage and Clearance (ACPL-W3xx)</li> </ul>	Smaller footprint
Optical: TLP5214, FOD8316, FOD8318, FOD8332, FOD8333, PS9402 Alternative: Si8285/86, ADuM4136, IS05451	HCPL-316J ACPL-330J ACPL-333J ACPL-331J ACPL-332J	ACPL-352J	<ul style="list-style-type: none"> <li>• 5A max. peak output current</li> <li>• Rail-to-rail Dual output</li> <li>• SiC/GaN MOSFET ready</li> <li>• Functional Safety Reporting</li> <li>• Integrated Active Miller Clamp</li> </ul>	Pin layout change
		ACPL-302J	<ul style="list-style-type: none"> <li>• Integrated DC-DC Controller for Floating power supply</li> <li>• Rail-to-Rail output voltage</li> <li>• DESAT and UVLO detection with isolated fault feedback</li> <li>• Integrated Active Miller Clamp</li> </ul>	Pin layout change
		ACPL-337J ACPL-336J ACPL-335J (Power MOSFET)	<ul style="list-style-type: none"> <li>• Up to 4A maximum peak output current</li> <li>• Rail-to-Rail output voltage</li> <li>• DESAT and UVLO detection with isolated fault feedback</li> <li>• Integrated Active Miller Clamp</li> </ul>	Pin layout change
		ACPL-339J	<ul style="list-style-type: none"> <li>• Dual Output drive for external NMOS and PMOS buffer</li> <li>• Integrated DESAT Detection</li> <li>• Fault + UVLO status feedback</li> </ul>	Pin layout change
PS9905	HCNW3120 ACNV3130	ACNT-H313	<ul style="list-style-type: none"> <li>• Market highest insulation voltage 2262Vpeak</li> <li>• 15mm creepage &amp; clearance</li> <li>• Very High CMR (40kV/μs)</li> </ul>	Smaller footprint
* Dual Channel				
<b>Digital Optocouplers</b>				
<b>Low Power 1MBd</b>				
FODM453 TLP109, TLP112, TLP114 PS8101, PS8821, PS9113, PS9122, PS9123	6N135/6N136 HCPL-05xx HCPL-253x HCPL-x53x	ACPL-M50L/ACPL-M51L ACPL-W50L	<ul style="list-style-type: none"> <li>• 80% power consumption saving</li> <li>• Low forward current (If &gt; 3 mA min)</li> <li>• High CTR ratio &gt;90% min @ If = 3 mA</li> <li>• Wide temperature range (-40°C to 105°C)</li> <li>• Wide supply voltage (2.7 V to 24 V)</li> <li>• Low supply voltage down to 2.25V and 4-pin configurable (ACPL-M51L)</li> </ul>	Smaller footprint
		ACPL-054L	<ul style="list-style-type: none"> <li>• Excellent CMR performance 15kV/μs @ Vcm 1500V</li> <li>• Offer higher working insulation voltage 1140Vpeak, isolation Voltage, 5000 Vrms (ACPL-W50L/K54L)</li> </ul>	Drop-in replacement
TLP714F, TLP719F PS8302, PS9313	HCPL-053x HCPL-253x	ACPL-K54L	<ul style="list-style-type: none"> <li>• Market highest insulation voltage 2262Vpeak</li> <li>• 15mm creepage/clearance in compact stretched S08</li> <li>• High transient overvoltage 12,000Vpeak</li> <li>• Low Input Current Drive</li> <li>• Higher CMR noise immunity</li> </ul>	Smaller footprint
OPI125/126 CNY65	HCNW135/136	ACNT-H50L	<ul style="list-style-type: none"> <li>• Market highest insulation voltage 2262Vpeak</li> <li>• 15mm creepage/clearance in compact stretched S08</li> <li>• High transient overvoltage 12,000Vpeak</li> <li>• Low Input Current Drive</li> <li>• Higher CMR noise immunity</li> </ul>	Smaller footprint
PS8302L2, PS9313L2 TLP719F x 2	ACPL-W50L x2	ACFL-5211U	<ul style="list-style-type: none"> <li>• Compact size in fine-pitch (0.8mm) in Stretched S012 package, reducing PCB Board space</li> <li>• Extended Temperature range up to 125degC</li> <li>• Bi-directional Feature</li> </ul>	Smaller footprint
<b>Low Power 5MBd</b>				
SFH6720T, SFH6721, TLP105, TLP2355, TLP2105, TLP2405	HCPL-0201/0211	ACPL-M21L ACPL-021L	<ul style="list-style-type: none"> <li>• Low Forward Current (If @ 1.6mA min), allowing direct drive from microcontroller without an input buffer</li> </ul>	Smaller footprint Drop-in replacement
	HCPL-220x/221x	ACPL-W21L	<ul style="list-style-type: none"> <li>• Low Supply Current (IDD @ 1.1mA max)</li> <li>• Low Supply Voltages (VDD @ 2.7 – 5.5V), with support to go lower to 2.5V</li> </ul>	Smaller footprint
SFH6731, SFH6732	HCPL-223x	ACPL-024L ACPL-K24L	<ul style="list-style-type: none"> <li>• S05 package to reduce PCB board space and cost</li> <li>• Min CMR at 25kV/μs @ Vcm 1000V to preserve data integrity under noisy environment</li> <li>• Wide Temperature range (-40°C to 105°C)</li> </ul>	Smaller footprint

Competitor Parts	Existing Parts	Upgrade Part	Upgrade Features	Footprint Information	
<b>Ultra Low Power 10MBd</b>					
FODM8061 TLP2361, TLP2366, TLP2468, TLP2160, TLP2161	HCPL-M6xx	ACPL-M61L ACPL-M62L	<ul style="list-style-type: none"> <li>• More than 80% power saving.</li> <li>• Low forward current (If) to allow direct drive from microcontroller.</li> <li>• Wide temperature range (-40°C to 105°C).</li> <li>• Wider supply voltage (2.7V-5.5V).</li> <li>• CMOS output to eliminate pull-up resistor.</li> <li>• Open-drain output (ACPL-M62L)</li> </ul>	Drop-in replacement	
	HCPL-060x	ACPL-061L		Drop-in replacement	
	HCPL-061x			Drop-in replacement	
	HCPL-063x HCPL-0661	ACPL-064L		Drop-in replacement	
FOD8163T TLP2768F, TLP2766F PS9324L2	HCPL-260x	ACPL-W61L/ACPL-C61L		<ul style="list-style-type: none"> <li>• Market highest insulation voltage 2262Vpeak</li> <li>• 14.2mm creepage &amp; clearance in compact stretched S08</li> <li>• High transient overvoltage 12,000Vpeak</li> <li>• Lowest power consumption &lt;2mW</li> </ul>	Smaller footprint
	HCPL-261x				Smaller footprint
	ACPL-W611				Smaller footprint
	ACPL-W60L				Smaller footprint
	ACPL-P611				Smaller footprint
	HCPL-263x	ACPL-K64L			Smaller footprint
	ACPL-K63L		Smaller footprint		
	HCPL-4661		Smaller footprint		
ACPL-W60L/W611/ P611, 6N137, HCPL- 260L/2601/2611, HCPL-261A/261N	ACPL-C61L ACPL-W61L		Smaller footprint		
FOD8160 PS9924	HCNW137/2601/2611 ACNW261L ACNV2601	ACNW261L ACNT-H61L	<ul style="list-style-type: none"> <li>• Compact size in fine-pitch (0.8mm) in Stretched S012 package, reducing PCB Board space</li> <li>• Extended Temperature range up to 125degC</li> <li>• Bi-directional Feature</li> </ul>		Drop-in replacement
				Stretched S08 package	
PS9351L2, PS9309L2, TLP2766F, TLP2768F x 2	ACPL-W61L x2	ACFL-6211U/ACPL-6212U			Smaller footprint
<b>High Speed Family (&gt;12.5MBd)</b>					
	HCPL-0708	ACPL-071L		<ul style="list-style-type: none"> <li>• Flexible supply voltages (3.3V/5V)</li> <li>• Lower Propagation Delay (&lt;40ns)</li> <li>• Wide temperature (-40°C to 105°C)</li> <li>• Glitch-Free Output</li> </ul>	Drop-in replacement
	HCPL-0738	ACPL-074L			
	HCPL-0708	ACPL-M75L		<ul style="list-style-type: none"> <li>• Flexible supply voltages (3.3V/5V)</li> <li>• Lower Propagation Delay (&lt;40ns)</li> <li>• Wide temperature (-40°C to 105°C)</li> <li>• Glitch-Free Output</li> </ul>	Smaller footprint
	HCPL-2400	ACPL-W70L		<ul style="list-style-type: none"> <li>• Flexible supply voltages (3.3V/5V)</li> <li>• Lower Propagation Delay (&lt;40ns)</li> <li>• Wide temperature (-40°C to 105°C)</li> <li>• Smaller 8mm C/C package (Stretched S06)</li> <li>• Glitch-Free Output</li> <li>• Lower Speed (15MBd)*</li> </ul>	Smaller footprint
	HCPL-2430	ACPL-K73L		<ul style="list-style-type: none"> <li>• Flexible supply voltages (3.3V/5V)</li> <li>• Lower Propagation Delay (&lt;40ns)</li> <li>• Wide temperature (-40°C to 105°C)</li> <li>• Smaller 8mm C/C package (Stretched S08)</li> <li>• Glitch-Free Output</li> <li>• Lower Speed (15MBd)*</li> </ul>	Smaller footprint
FOD0720, FOD8012A	HCPL-0710/20/21 ACPL-072L	ACPL-077L ACSL-7210		<ul style="list-style-type: none"> <li>• Flexible supply voltages (3.3V/5V)</li> <li>• Wide temperature (-40°C to 105°C)</li> <li>• Lower PWD (&lt;6ns) (ACPL-077L)</li> <li>• 3.75kViso Bi-directional in &lt;2mm low height (ACSL-7210)</li> </ul>	Drop-in replacement for ACPL-077L
	HCPL-7710/20/21	ACPL-772L	Smaller footprint in dual-channel Bi-directional (ACSL-7210)		

Competitor Parts	Existing Parts	Upgrade Part	Upgrade Features	Footprint Information	
<b>Isolation Amplifier</b>					
AMC1204/B, AMC1305M25 AD7401, AD7403	HCPL-786x	ACPL-796J	<ul style="list-style-type: none"> <li>External clocking (up to 20MHz) for multichannel synchronization</li> </ul>	SO-16 footprint	
AMC1305L25 AD7405		ACPL-798J	<ul style="list-style-type: none"> <li>Up to 25MHz external clocking</li> <li>LVDS clock and data interface</li> </ul>		
AMC1203/B AD7400/A, AD7402 TLP7830	HCPL-7860 ACPL-C797 ACPL-7970	ACPL-C799	<ul style="list-style-type: none"> <li>50mV linear range</li> <li>10MHz internal clock</li> <li>16-bits resolution no missing codes (12 bits ENOB)</li> <li>77dB SNR (typ)</li> <li>1.3uV / C offset drift (max.)</li> <li>3V to 5.5V wide supply range for digital interface</li> </ul>		
AMC1200/B TLP7820, TLP790 Si8920 PS8551	HCPL-7800 HCPL-7800A HCPL-7840 ACPL-C78x	ACPL-C79B, ACPL-C79A, ACPL-C790 ACPL-790B, ACPL-790A, ACPL-7900	<ul style="list-style-type: none"> <li>±0.5%/±1%/±3% gain accuracy</li> <li>Better linearity</li> <li>30% smaller package size</li> <li>8 mm Creepage and Clearance</li> <li>1414 Vpeak working insulation voltage</li> </ul>	Smaller footprint	
ISO122 AMC1200/B TLP7820		ACPL-C87A ACPL-C87B ACPL-C870	<ul style="list-style-type: none"> <li>-0.2V input range voltage sensor</li> <li>± 5% / ±1% / ±3% gain accuracy</li> <li>-35 ppm/°C Low Gain Drift</li> <li>-0.3 mV Input Offset Voltage</li> <li>3 V to 5.5 V Wide Supply Range for Output Side</li> </ul>	Smaller footprint	
		HCPL-788J / HCPL-785J	<ul style="list-style-type: none"> <li>-0.2V input range voltage sensor</li> <li>±0.5%/±1%/±3% gain accuracy</li> <li>-35 ppm/°C Low Gain Drift</li> <li>-0.3 mV Input Offset Voltage</li> <li>3 V to 5.5 V Wide Supply Range for Output Side</li> </ul>		
		HCPL-7510	<ul style="list-style-type: none"> <li>± 3% gain accuracy</li> <li>Overcurrent fault detection</li> </ul>		
		HCPL-7520	<ul style="list-style-type: none"> <li>± 5% gain accuracy</li> <li>Single Ended Output</li> </ul>		
AMC120/B TLP7820 Si8920	ACPL-C790 ACPL-C79A ACPL-C79B	ACNT-H79A ACNT-H790	<ul style="list-style-type: none"> <li>Market highest insulation voltage 2262Vpeak</li> <li>14.2mm creepage &amp; clearance</li> <li>-50ppm/° Low Gain Drift</li> <li>± 1% / ± 3% gain accuracy</li> </ul>	Stretched SO8 package	
<b>Intelligent Power Module Interface Optocoupler</b>					
SFH6345 TLP550, TLP559, TLP759	HCPL-4502 HCPL-4503	ACPL-K453	<ul style="list-style-type: none"> <li>8 mm Creepage and Clearance</li> <li>50% smaller package size</li> </ul>	Smaller footprint	
PS8302L2 TLP719F	HCPL-4504	ACPL-W454 ACPL-P454		Smaller footprint	
PS9213, PS9313L2 TLP719F	HCPL-4506	ACPL-W456 ACPL-P456		Smaller footprint	
PS9303L2 TLP706, TLP715F, TLP718F	ACPL-4800	ACPL-W480 ACPL-P480		Smaller footprint	
TLP105, TLP108	HCPL-M452/3/4/6	ACPL-M484 ACPL-M483		<ul style="list-style-type: none"> <li>Higher CMR 30kV/μs</li> <li>10MBd speed</li> <li>Totem-pole output, positive logic (M484), negative logic (M483)</li> </ul>	Faster speed
PS9309L2 TLP715F, TLP718F	HCPL-4502/03/04/06 HCPL-0452/53/54/66	ACPL-W484 ACPL-W483		<ul style="list-style-type: none"> <li>8 mm Creepage and Clearance</li> <li>Higher CMR 30kV/μs</li> <li>10MBd speed</li> <li>Totem-pole output, positive logic (W484), negative logic (W483)</li> </ul>	Faster speed
	HCPL-4502/03/04/06	ACNV4506		<ul style="list-style-type: none"> <li>13mm Creepage and Clearance</li> <li>Higher Working Voltage Viorm 2262Vpk</li> <li>Higher CMR 30kV/μs</li> <li>Totem-pole output, positive logic</li> </ul>	Higher Working Voltage
FODM452, FODM453 TLP109, TLP112, TLP114 PS9113, PS9122	HCPL-M452/53/54	ACPL-M43U		<ul style="list-style-type: none"> <li>Wide temperature (-40°C to 105°C)</li> <li>Low LED input drive current IF 10mA</li> </ul>	Drop-in replacement
	HCPL-M456	ACPL-M46U	<ul style="list-style-type: none"> <li>Wide temperature (-40°C to 105°C)</li> </ul>	Drop-in replacement	

Note: Drop-in-replacement means no PCB board redesign is required

Upgrade	Feature	Benefit
<b>High Voltage Insulation</b>		
<b>Improved Isolation/Insulation</b> Ability to protect surrounding circuitry against physical damages resulting from differential voltages.	ACNV/ACNT family offers highest available <b>working voltage</b> ratings with regulatory approval per IEC/EN/DIN EN 60747-5-5 of <b>2262 V peak</b> .	Meets international safety regulations and standards. Provides better <b>isolation</b> and overall <b>safety</b> performance.
<b>Noise Isolation</b>		
<b>High CMR</b> Common-mode transient rejection or signal isolation of data through suppression of noise transients.	Offers guaranteed CMR performance up to <b>100 kV/μs</b> which is the highest available in the market.	Improves system performance, and <b>reliability</b> . More robust systems and better <b>data integrity</b> meet EMI and ESD requirements.
<b>Power Consumption</b>		
<b>Drive Current, I<sub>F</sub></b> Low Drive Current, LED drive current.	Offers the <b>lowest I<sub>F</sub> (up to 40 μA)</b> devices in the market and broadest HCMOS compatibility.	<b>Eliminates additional LED drive circuitry</b> . Improves system efficiency and reduces power consumption and LED degradation.
<b>Lower Power Supply</b> Lower power supply (3.3V)	Lower the <b>power consumption</b> and meets JEDEC low voltage requirements.	Up to <b>50% energy saving</b> .
<b>Flexible Supply Voltages</b> (3.3V/5V)	Support a combination of two different supply voltages at the input and output.	<b>Built-in internal level shifter</b> , eliminate the need of extra power supply. 3.3V or 5V. 3.3V helps to improve the overall power consumption.
<b>Temperature</b>		
<b>Temperature</b> The DC, speed performance and the reliability information is ensured at the specific temperature range.	Support up to <b>-40°C to 125°C</b> temperature range.	Allow extreme temperature operation.
<b>Speed Benefits</b>		
<b>Propagation Delay, t<sub>p</sub></b> Describes how quickly a logic signal can propagate through the system.	High speed digital optocouplers to meet wide range of applications with <b>t<sub>p</sub> as low as 22 ns</b> .	Increase <b>switching efficiency</b> and better speed performance.
<b>Upgrade Pulse Width Distortion, PWD</b> PWD is the difference between tPHL and tPHL and often determines the maximum data rate capability of a transmission system.	The lowest PWD offered by optocoupler is <b>2 ns</b> .	To ensure signal <b>data integrity</b> over long bus line.
<b>Package and Space Savings</b>		
<b>Multi-Channels, Bi-directional Features</b>	Integrated <b>dual, triple, quad</b> with <b>bi-directional</b> channels offers in small S08 and S016 package. Bi-directional 2 channels with LED direct drive in Stretched S012 package	The integrated bi-directional channels help in <b>space savings</b> and ease of designs.
<b>Surface Mount Device</b> SMD permits more component density than DIP.	Smaller package to deliver the same functionality as standard DIP. True surface mount technology and standard footprint.	Lower <b>assembly cost</b> , easier and faster handling as well as better solderability.
<b>ACNT 15mm Creepage/Clearance Package</b>	Compact stretched S08 package able to withstand high insulation 2,262 Vpk and transient overvoltage 12,000 Vpk	Provides <b>space savings</b> . Meets IEC/UL/CSA new/latest revision equipment standards for C/C, insulation voltage and/or transient overvoltage needs.
<b>ACPL-P/W/H/K 8mm Creepage/Clearance Package</b> <b>ACNU 11mm Creepage/Clearance Package</b>	The package is 50% smaller than conventional DIP package. It can withstand high isolation voltages and meet regulatory requirements such as IEC/UL/CSA standards.	Provides <b>space savings</b> . Allows high voltage surge protection. Meets many IEC/UL/CSA equipment standards that call for clearance and creepage of <b>8mm</b> .
<b>Smaller S05 Package</b>	<b>Smaller S05</b> package (as compared to existing S0-8 package)	Provides greater than <b>40% space savings</b> .

Existing Parts	Upgrade Part	Upgrade Features	Pricing Comparison	Footprint Information
<b>Versatile Link Transmitter and Receivers</b>				
HFBR-1521Z / HFBR-2521Z HFBR-1531Z / HFBR-2531Z HFBR-1521ETZ / HFBR-2521ETZ HFBR-1531ETZ / HFBR-2531ETZ HFBR-1522Z / HFBR-2522Z HFBR-1532Z / HFBR-2532Z HFBR-1522ETZ / HFBR-2522ETZ HFBR-1532ETZ / HFBR-2532ETZ HFBR-1528Z / HFBR-2528Z	AFBR-1521CZ AFBR-2521CZ AFBR-1531CZ AFBR-2531CZ AFBR-1541CZ AFBR-2541CZ AFBR-1528CZ AFBR-2528CZ	<ul style="list-style-type: none"> <li>-40°C to +95°C temperature range</li> <li>• 3.3V or 5V operating voltage</li> <li>• High efficient transmitter</li> <li>• TTL/CMOS receiver output</li> <li>• Lower power consumption</li> <li>• Low propagation delay with guaranteed max. part-to-part skew</li> <li>• High dynamic receiver optical input range</li> </ul>	<ul style="list-style-type: none"> <li>Price Premium due to significant better features: <ul style="list-style-type: none"> <li>• Industrial temp range</li> <li>• Low propagation delay skew</li> <li>• 3.3V or 5V operation</li> <li>• No Rx optical saturation</li> </ul> </li> </ul>	Same footprint, changes to Tx driver and Rx output interface required. Optical backwards compliant, but check power budget.
HFBR-1521Z / ETZ HFBR-1522Z / ETZ HFBR-1528Z / AFBR-1529Z	AFBR-1629Z AFBR-1639Z	<ul style="list-style-type: none"> <li>-40°C to +95°C temperature range</li> <li>• 3.3V or 5V operating voltage</li> <li>• High efficient transmitter</li> <li>• Lower power consumption</li> <li>• -40°C to +85°C temperature range</li> <li>• 3.3V or 5V operating voltage</li> </ul>	<ul style="list-style-type: none"> <li>Price Premium due to significant better features: <ul style="list-style-type: none"> <li>• Industrial temp range</li> <li>• Tx integrated driver</li> </ul> </li> </ul>	
HFBR-1528Z / HFBR-2528Z	AFBR-1629Z AFBR-2529Z	<ul style="list-style-type: none"> <li>• DC to 50MBd</li> <li>• Lower power consumption</li> <li>• Higher EMI Immunity</li> <li>• Lower propagation delay time</li> <li>• Power on Reset</li> </ul>	Up to 20% cost saving	Tx: Same footprint, but digital input, no external driver required Rx: drop-in replacement
<b>Plastic Optical Fiber (POF) Cable &amp; Connectors</b>				
HFBR-RUDxxxZ HFBR-EUDxxxZ	AFBR-HUDxxxZ	<ul style="list-style-type: none"> <li>• Halogen Free</li> </ul>	Up to 5% cost saving	Drop-in replacement
HFBR-4501Z / HFBR-4511Z HFBR-4503Z / HFBR-4513Z HFBR-4506Z	HFBR-4531Z HFBR-4532Z HFBR-4533Z HFBR-4535Z	<ul style="list-style-type: none"> <li>• Simplified POF connector termination, no crimp tool required</li> <li>• No metal at connector, preferred in high voltage and medical applications</li> </ul>	Similar prices	Drop-in replacement
<b>Miniature Link Transmitters and Receivers</b>				
HFBR-1412xZ HFBR-1414xZ HFBR-2416xZ	HFBR-1412xPZ HFBR-1414xPZ AFBR-2418xZ AFBR-2419xZ	<ul style="list-style-type: none"> <li>• ESD enhanced device: 2kV HBM</li> <li>• Integrated quantizer</li> <li>• Digital TTL/CMOS compatible output</li> <li>• Analog receiver signal strength indicator output</li> <li>• Reduced design effort and PCB space</li> <li>• Enhanced EMC performance</li> <li>• Short propagation delay</li> <li>• Lower power consumption</li> <li>• 3.3V or 5V supply voltage</li> </ul>	<ul style="list-style-type: none"> <li>• Price premium due to significant better features: <ul style="list-style-type: none"> <li>• Fully integrated Rx with digital output</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Drop-in replacement</li> <li>Same footprint, but digital output along with RSSI</li> </ul>
<b>High Galvanic Insulation Link</b>				
HFBR-3810xZ	AFBR-390525RZ	<ul style="list-style-type: none"> <li>• VDE Certification as per IEC 60747-5-5</li> <li>• Lower power consumption</li> <li>• Shorter propagation delay with guaranteed max part-to-part skew</li> </ul>	Up to 30% cost saving	Similar footprint
HFBR-3810xZ	AFBR-3905xxRZ AFBR-3950xxRZ	<ul style="list-style-type: none"> <li>• VDE Certification as per IEC 60747-5-5</li> <li>• Up to 50 kV peak transient voltage suppression</li> <li>• Up to 12 kV effective working voltage</li> <li>• Four creepage / clearance length options</li> <li>• Two speed options: DC to 5 Mb/s and DC to 50 Mb/s</li> </ul>		Different footprints
<b>Fast Ethernet POF &amp; MM FOG</b>				
AFBR-5972Z	AFBR-5972EZ AFBR-5972BZ	<ul style="list-style-type: none"> <li>• 45% lower max power consumption</li> <li>• Better EMI Immunity for highest system robustness</li> <li>• LVDS I/Os for direct interface to FPGAs</li> <li>• Up to 250Mb/s link rate for higher bandwidth requirements</li> </ul>	Price premium due to significant better features	Same footprint, but different electrical interface
HFBR-5961ALZ	AFBR-59E4APZ-LH	<ul style="list-style-type: none"> <li>• 60% lower max power consumption</li> </ul>	Price premium due to significant lower power consumption	Same footprint, same optical interface (-LI with reduced LDP), change of external data I/O termination required
HFBR-57E5APZ	AFBR-57E6APZ	<ul style="list-style-type: none"> <li>• 50% lower max power consumption</li> </ul>	Price advantage possible	Drop-in replacement
AFBR-59E4APZ	AFBR-59E4APZ-HT	<ul style="list-style-type: none"> <li>• 95°C max Temp</li> <li>• Four additional housing leads for improved signal grounding and heat dissipation (AFBR-59E4APZ)</li> </ul>	Price premium	Four additional housing leads
AFBR-57E6APZ	AFBR-57E6APZ-HT		Small price premium	Drop-in replacement

# NEW INDUSTRIAL FIBER PRODUCTS

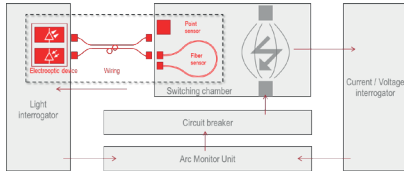
## Optical Sensing Solution for e.g. Arc Flash Detection in Electrical Power Grids

### Principle of Arc Flash Detection:

An optical sensor-fiber catches the light of an arc flash event and transports it to an optical sensor transceiver, which is part of an electrical protection and switching unit. An optical self test mechanism is integrated to ensure highest reliability.

### Benefits of Sensor Transceiver:

- 650 nm high power Transmitter
- Receiver with monolithic IC integrating photodiode and amplifier (TIA)
- Wide dynamic range and high linearity
- High EMI robustness
- Compact footprint with integrated metal shield



Description	Part No.
Sensor Transceiver	AFBR-S10TR001Z
Sensor fiber POF	AFBR-TUS500Z
POF Duplex Fiber	AFBR-HUD500Z
VL Duplex Bulkhead	AFBR-4536EZ
Versatile Link Simplex Bulkhead	HFBR-4505Z
Versatile Link Duplex Connector	AFBR-4526Z
VL Simplex Connector	HFBR-4531Z
Eval Kit for Sensor Transceiver	AFBR-S10EB001Z

## High Voltage on-board Insulation - AFBR-39xxxxRZ

### High Voltage Galvanic Insulation Link

Creepage/Clearance	25mm	50mm	75mm	100mm
Transient peak voltage suppression*	up to 15kV	up to 27kV	up to 40 kV	up to 50 kV
Max. effective working voltage*	3kV	6kV	9kV	12kV
Speed: DC to	5MBd	50MBd	5MBd	50MBd
Part number:	AFBR-390525RZ	3905025RZ	390550RZ	3905050RZ
	390575RZ	3905075RZ	390500RZ	390500RZ

\*as per IEC-60664-1 @2000m above sea level and pollution degree 2, inhomogeneous field conditions may lead to partial discharge through air for these voltages

### Benefits:

- High Voltage insulation that can't be reached with standard packages
- Integrated component with Tx, Rx and Waveguide
- Easy to assemble and solder
- Fully tested including insulation properties
- Tested according IEC 60747-5-5
- VDE Certification
- Datarate options for PWM or higher speed communication

**Applications:** Mid voltage power stations, Transportation, Inverters, High Voltage Power Supplies, Test & Measurement, Medical

## New Extended Temperature Products – Versatile Link family and Fast Ethernet Transceivers

There is more and more need in the marketplace for extended temperature products in factory applications. This is a result of increasing space constraints and more compact equipment on the factory floor. Also the need for multiple links means that more heat is generated. To meet these needs, Broadcom have released a series of industrial fiber products with extended temperature -40°C to +95°C

### Versatile Link Family - Extended temperature versions

DC to 5MBd AFBR-15x1CZ / AFBR-25x1CZ  
DC to 10MBd AFBR-1528CZ / AFBR-2528CZ

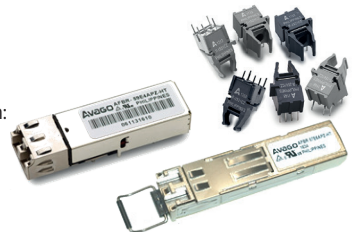
### 125 MBd Fast Ethernet Transceivers –with industry leading low power consumption:

AFBR-59E4APZ-HT SFP – 145mA (typ), 205mA (max)

**30% less than HFBR-596x**

AFBR-57E6APZ-HT SFP – 76mA (typ), 110mA (max)

**50% less than HFBR-57E5APZ**










Note: These new transceivers are perfectly suited to be used in dense packages and without fan cooling: The low power dissipation (base parts) minimizes the intrinsic heating and the higher operation temperature reduces the cooling needs.

Existing Parts	Upgrade Part	Upgrade Features	Footprint Information
HEDS-9140	AEDT-9810	<ul style="list-style-type: none"> <li>• High Resolution of up to 5000 Counts per Revolution</li> <li>• -40°C to 115°C Operating Temperature</li> <li>• Low Power Consumption (Typical Icc: 20 mA)</li> <li>• Spatial play tolerance of 0.40mm</li> <li>• Allows motor shaft axial play of <math>\pm 0.15</math>mm</li> <li>• Choice of Index Pulse Width (90 and 180 deg)</li> <li>• Better ESD Immunity HBM 4kV (JESD22-A114D)</li> </ul>	<ul style="list-style-type: none"> <li>• Pin Compatible to legacy HEDS-9xxx Series</li> </ul>
HEDC-55xx	AEDC-55xx	<ul style="list-style-type: none"> <li>• Available in two or three channel encoder A, B and I</li> <li>• Latching connector design</li> <li>• Single 5V supply</li> <li>• Resolution of up to 5000 CPR</li> <li>• TTL compatible, with single ended or differential output.</li> <li>• Quick assembly</li> <li>• No signal adjustment required</li> <li>• Small size -40 °C to 85 °C operating temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Compatible mounting to legacy HEDC-55xx Series</li> <li>• External mounting ears option available for larger motors.</li> </ul>
HEDM-550x	AEDM-5810	<ul style="list-style-type: none"> <li>• High Resolution - up to 5000 CPR</li> <li>• Operating temperature -40°C to +85°C</li> <li>• Quick and easy assembly</li> <li>• No signal adjustment required</li> <li>• Cost Effective solution</li> <li>• Small size</li> <li>• TTL compatible output</li> <li>• Single 5V supply with <math>\pm 10\%</math> tolerance</li> <li>• Differential Output (Line Driver) available with AEDL-581x Series</li> </ul>	<ul style="list-style-type: none"> <li>• Compatible mounting to legacy HEDM-55xx Series</li> <li>• External mounting ears option available for larger motors.</li> </ul>
AEDR-8320	AEDR-8723	<ul style="list-style-type: none"> <li>• Analog Output option - 2 channels differential analog output (Sin, /Sin, Cos, /Cos) and with a digital index (I) output.</li> <li>• Operating voltage of 3.3V or 5V supply</li> <li>• Built in LED current regulation, hence no external biasing resistor needed.</li> <li>• -20°C to 85°C absolute operating temperature</li> <li>• High encoding resolution: 318 (lines/inch)</li> </ul>	<ul style="list-style-type: none"> <li>• Surface mount leadless package - 3.95 mm (L) x 3.4 mm (W) x 0.9562 mm (H)</li> </ul>
AEDR-8300 AEDR-8400 AEDR-8500	AEDR-8710	<ul style="list-style-type: none"> <li>• World smallest 3 channels reflective technology encoder.</li> <li>• Digital Output option - 3 channels TTL compatible; two channel quadrature digital outputs for direction sensing and a 3rd channel, Index digital output.</li> <li>• Built in interpolator for 4x, 8x and 16x interpolation.</li> <li>• Operating voltage of 3.3V or 5V supply</li> <li>• Built in LED current regulation, hence no external biasing resistor needed.</li> <li>• -20°C to 85°C absolute operating temperature</li> <li>• Encoding resolution: 318 (lines/inch)</li> </ul>	<ul style="list-style-type: none"> <li>• Surface mount leadless package 3.95 mm (L) x 3.4 mm (W) x 0.9562 mm (H)</li> </ul>
AEAT-6600-516	AEAT-8800-Q24	<ul style="list-style-type: none"> <li>• Smaller form factor with QFN 5mm x 5mm package</li> <li>• UVW pinout for low end comutation motor applications</li> <li>• Higher accuracy with lower step jump for absolute encoder applications</li> <li>• Lower latency for incremental encoder operations across different resolutions</li> <li>• Typically lower latency &gt; 3X</li> </ul>	<ul style="list-style-type: none"> <li>• Smaller form factor with QFN 5mm x 5mm package</li> </ul>








# Optical Encoders

Module		Housed	
<b>Transmissive</b>			
HEDS-90/91/92x 	HEDS-97xx 	AEDB/T-9140 	AEDB/T-9340 
HEDL-90/91xx 	HEDT-90/91xx, AEDT-981x (Wide range upto 5000CPR)		
HEDL-55/56xx 		HEDS/HEDM-55/56xx, AEDM-58xx (2 or 3Ch Upto 5000CPR)	
HEDC-55/56xx, AEDC-55/56xx (Upto 5000CPR) 			

Incremental

Reflective	
AEDR-83xx 	AEDR-8400 
AEDR-8320 	AEDR-8500 (2x,4x interpolation) 
AEDR-87xx 	AEDR-886AD (4x, 8x, 16x interpolation) 
HEDR-54xx 	HRPG-Axxx (Rotary Pulse Generator) 
HEDR-5xxx (Upto 3600CPR) 	

Optical Module		Magnetic	
<b>Transmissive</b>			
AET-7000 	AET-9000 (17Bits/2048 SIN/COS) 	AET-60xx 	
AET-84/86AD 		AET-8800 (Prog Upto 168bits/4096CPR, lower latency, product released 1H'2017) 	

Absolute

AS38 Ind Housed Absolute ST+MT Energy		Integrated Circuit Decoder/Counter/Line Driver	
			
HEDx-51/61xx 		HCTL-2001, 2021, 2017, 2022, 2032 AEC-7272/7273/2631 -30V, AEL-5000 (5V, 2Mhz)	

Absolute



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Broadcom's extensive product portfolio serves multiple applications within four primary end markets: wired infrastructure, wireless communications, enterprise storage and industrial & others. Applications for our products in these end markets include: data center networking, home connectivity, broadband access, telecommunications equipment, smartphones and base stations, data center servers and storage, factory automation, power generation and alternative energy systems, and displays. Broadcom combines global scale, engineering depth, broad product portfolio diversity and superior execution and operational focus to deliver category-leading connectivity products so its customers can build and grow successful businesses today and in the future.