

Avionic Linecard

Avionic, Military, Medical and Industrial Components

50 Years
HighRel

 **Protec**
HighRel Components

Founded in 1976 and is successful in the sales of High Reliability components.

We are particularly specialised in highly qualified components for industrial, military and space applications.

In instances of obsolescence and supply problems, we can also offer our customers effective solutions with our extensive product and market knowledge.

Our customer oriented warehouse, equipped with a modern ESD protection system, guarantees reliable component supply.

With our design-in and market oriented expertise, we can provide long term support for your projects and applications.

Through our distributor and rep strategy, we are the "extended arm" of our Manufacturers. When required we will put you directly in touch with our manufacturer's specialists.

Our first priority is a long term, successful partnership with our customers and manufacturers.



	DACH			Nordic				BeNeLux														
	Germany	Austria	Switzerland	Denmark	Sweden	Norway	Finland	France	Italy	Spain	Portugal	Greece	UK & Ireland	Belgium	Luxembourg	The Netherlands	Czech Republic	Hungary	Poland	Romania	Israel	Turkey
AEM Inc.	•	•	•	•	•	•	•	•		•	•			•	•	•	•	•	•			
AirBorn	•	•	•	•	•	•	•						•									
Avalanche Techn.	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Axtal	•	•	•	•	•	•	•	•					•	•	•	•						
CalRamic	•	•														•	•	•	•			
Excalibur Systems	•	•	•																			
GSI Technology	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•		
HOLT	•	•	•	•	•	•	•							•	•	•						
Infineon / IR HighRel	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
NanoXplore	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Macom	•	•	•			•		•		•	•		•	•		•						
MOOG Protokraft	•	•	•																			
Q-Tech	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Skyworks DS	•	•	•	•	•	•	•										•	•	•	•		
SMC	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•		
Smiths Canada	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•		
Teledyne e2v	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•		
VMI	•	•														•	•	•	•	•		
VPT Components	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VPT	•	•	•																			
Viking Technology	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•

a specialized distributor of high quality products for the electronics industry, particularly for the Space, Avionic, High Voltage, High Temperature and niche industrial markets.

We support customers and manufacturers with our expertise in:

- EUS requirements and licensing processes
- CoC requirements
- Design in support
- Export classifications and rules
- Product trainings

Support and understanding of terms like SLDC, LOT acceptance, PIND, TID, ELDRS, SEE, SEU, SEL, Proton testing and many more industry specific terms.



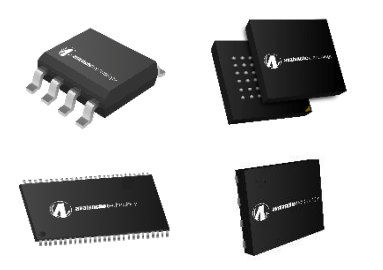
HighRel Fuses	50 - 180 V	125mA - 20A
HighRel Chip Beads	30 - 1000Ω	200mA - 4A
TWM	RoHs to Tin Lead Conversion	



Nano D	Nano-D metal shell - exceed MIL-DTL-32139	9-91 contacts
Micro D / High Speed	Micro-D metal shell - exceed MIL-DTL-32139	9-128 contacts
Macro D	(3A up to 42A per contact)	8-150 contacts
High Speed Rectangular	Vertical board-mount, right angle board-mount, cable I/O, and flex circuit mounting	40-500 contacts
SInergy	Modular hybrid solution 1-5 configurable bays	up to 25Gbps
Stackable	High-density, board-to-board stacking	28-200 contacts
Rectangular R&Z Series	PCB Connectors	10-604 contacts
Z-Axis Interposer	High-density, board-to-board or flex circuit stacking	20-175 contacts
Circular	Micro-miniature circular - similar performance as D38999 connectors more compact & lighter package	up to 10G
Flexible Assemblies	Highly reliable, flexible, printed circuit assembly single-sided, double-sided, multi-layer, rigid-flex	
Cable / Harness	Copper, RF and more — terminated with any connector	
Active Optical Cables	Fully-qualified, Space-Rated Active Optical Cable (SAOC®) & a Rugged Active Optical Cable (RAOC®)	

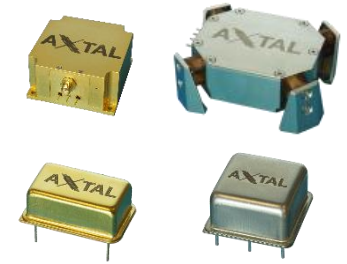


Serie High Performance	1Mb / 4Mb / 8 Mb/ 16Mb	1.8V / 3.0V
Serial SPI	1Mb / 4Mb / 8 Mb/ 16Mb	3.0V
High-Rel Serial SPI	16Mb	1.8V / 3.0V
Parallel x8	1Mb / 4Mb / 8Mb / 16Mb / 32Mb	3.0V
Parallel x16	1Mb / 4Mb / 8Mb / 16Mb / 32Mb / 64Mb	3.0V
High-Rel Parallel x16	16Mb / 32Mb / 64Mb	3.0V





OCXO	±0,005ppm / Ultra Low Noise	10MHz to 150MHz
TCXO	±0,5ppm	1MHz to 2,5GHz
VCXO	±5ppm / Low Noise	1MHz to 1,5GHz
SAW Oscillator	±350ppm	500MHz to 1,6GHz
Quartz Filter	±1ppm	10MHz to 100MHz
PRECISION CRYSTALS	SC, IT and AT-cut crystals for frequency control, instrumentation , military, space and other markets	



MosFets, Diodes, RF Transistors, RF Diodes and more	Plastic and Hermetic	
& any Infineon part for Military applications	Infineon Board approval required, for military applications.	



Avionics Communication	MIL-STD-1553, MIL-STD-1760, MMSI, H009, ARINC-429/575, ARINC-708, ARINC-717, ARINC-664 p7 (AFDX), Ethernet, RS-232/422/485, ARINC-825 (Canbus), Discretes, Analog to Digital - Digital to Analog	
Avionics test & simulation cards and systems	Interface Cards (PCIe/VPX/USB/ETH/ etc.), Protocol Converters, Rugged Systems Mil-1553 Accessories (Box Couplers, In-line Couplers and Switches)	



ARINC 429	Line Drivers and Receivers, Protocol IC's	Galvanic Isolation
ARINC 825 / CAN	Controller, Transceiver, HighTemp	High Temperature up to 200°C
MIL-STD-1553	Protocol IC's Dual Transceivers, Encoder/Decoder	Drop-In Replacements available
Discrete to Digital	6/8/16/32-Channels	Level 3 Lightning Protection



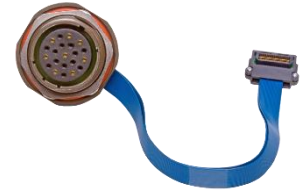
RF - Amplifiers	Gain Blocks, Low Noise, RF Power, Linear, Transimpedance	
RF - Attenuators	Digital, Fixed, Voltage Varriable	
RF - Capacitors	Beam Lead, Binary Chip, Bypass, HighQ, MNS, MNOS	
RF - Couplers	Hybrid, Stripline, Broadband	
RF – Diodes	PIN, Step Recovery, Schottky, Varactor Tuning	
RF – Filters	Band Pass, MoCA, Horizontal & Vertical, Low Pass, Diplex, Triplex Filters	
RF - Frequency Conversions	Down Converter, Up Converter, Multipliers, Mixer, Recievers, Transcievers	
RF - Frequency Generation	Comb, Voltage Controlled	
RF – Limiters	C-Band to V-Band	
RF – Switches	Drivers, DPDT, Limiter, SPST, SPDT to SP8T	
RF - Magnetics	Inductors, Baluns, Transformers	
Optical – Clock and Data Recovery	VCEL Driver, DML Driver with CDR / TIA / EML	
Optical – Receiver Modules	APD Photorecievers, PIN Photorecievers, HighSpeed Photodetectors and Recievers	
Optical - Laser	Distributed Feedback Lasers, Fabry-Perot Lasers	2,5G, 10G, 25G
Optical – Modulator Drivers	NRZ, PAM, Coherent	Up to 58Gbps
Optical – Post Amplifiers	Limiting Amplifier	
Optical - Photodiodes	APD Photodiode, PAM4 PIN Photodiodes	10G, 25G, 50G, 100G
Optical – Transimpedance	Client Side, Coherent	
Networking - Crosspointswitch	Crosspoint Switches and Signal Conditioners	



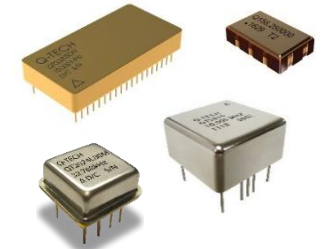
NG-Ultra (JEDEC Flow)	Quadcore ARM R52 @ 600MHz 32 HSSL @ 12.5 Gbps / SpW & DDR 3&4 PHY	500KLUT
NG-Ultra300 (JEDEC Flow)	16 HSSL @ 12.5 Gbps / SpW & DDR 3&4 PHY Embedded ADCs & DACs	290KLUT



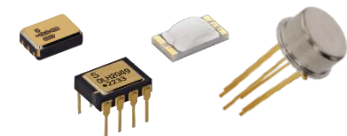
Optical Transceivers		Up to 10.3Gbps
Ethernet Media Conv.		Up to 10.3Gbps
Ethernet Switches		Up to 10.3Gbps
Video Media Converters	DVI, ARINC818, Camera Link, HD-SDI and 3G-SDI	



<u>XO</u>	CMOS, TTL, LVDS, LVPECL	15kHz - 250MHz
<u>TCXO</u>	HCMOS, Sine	3MHz - 100MHz
<u>VCXO</u>	HCMOS, Sine	3MHz - 100MHz
<u>OCXO</u>	CMOS, Sine	1MHz - 125MHz
<u>SAW</u>	Sine	400MHz - 1,5GHz
<u>MCXO</u>	CMOS or Sine 5	5MHz - 100MHz
<u>B+ Products</u>		15kHz - 250MHz



Optocouplers	Many different types available like (OLS049 or OLS249) MILPRF19500 or MILPRF38534	
RF Diodes	PIN, Schottky, Varactor, Limiter	up to JAN equiv.
SPDT	SPDT and ST4T	up to 5GHz
RF Amplifiers LNA	Small QFM Packages 2x2mm	up to 6GHz
Other RF parts	Combined LNA with switch in one package, Gain Blocks	



TVS Diodes	0.2W - 30KW	5V - 400V
Schottky Diodes	10mA - 120A	10V - 200V
Ultrafast Rectifiers	1A - 60A	200V - 1200V
SiC Fets	3 - 50A	650 and 1200V
Chips	Silicon Chips for all devices we make	



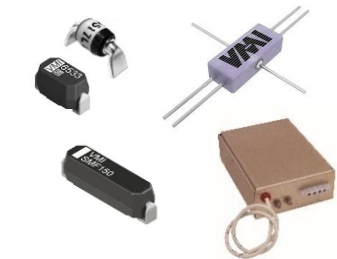

LightABLE SM	12.5Gbps / 4TRx or 12Tx / 12Rx	Pluggable
LightABLE SL	12.5Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer
LightABLE28 SL	28Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer
LightCONEX	12.5Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer




ADC	Base-Band up to Ka-Band	35GHz 12.8GSps
DAC	Base-Band up to Ka-Band	12b 12GSps
Memory	DDR, PROM, SRAM, CBRAM, FIFO, MRAM	
Processors	NXP optimized Power, Mil Temp. Range	
SiP Modules	External parts like Memory on one Board	




DCDC – Converters	Single, Dual, Triple 3.3, 5, 5.2, 12, 15 / Dual ±5, ±12, ±15	12-50V
POL	3.3 - 5.5V	.8V to 3.4V

HV Diodes	2 to 20kV / 30 to 3000ns / 10mA to 3.5A / Axial & SMD	QPL available
HV Assemblies	HV Stacks & Bridges	
HV Opto	10kV and 15kV Optodiode & Optocouplers up to 25kV	



Transistors	NPN and PNP Small Single and Power BJTs	up to JANSR/F
Diodes	Zener, TC Zener, Schottky, Ultra Fast, Rectifier	up to JANS



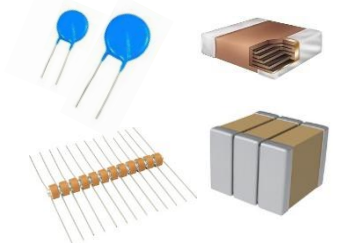
DRAM Modules	DDR5 (coming soon), DDR4, DDR3, DDR2, DRAM	up to 32GB
STORAGE (Flash/SSD)	2.5 in. SSD, 1.8 in. SSD, M.2 SSD, slimSATA, etc.	
Rugged Memory	ParallelCell MCP, ParallelSSD	
Persistent Memory	DDR4 NVDIMM, Energy SubSystems (ESS)	



SRAM	SigmaQuad-II+ (x18 / x32 configuration) 350 MHz	288M / 144M / 72M
SRAM	SyncBurst & NBT (x18 / x32 configuration) 333 MHz	144M / 72M / 36M
APU	High Speed Parallel Computing for SAR, Imaging and AI Applications	

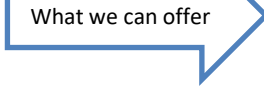
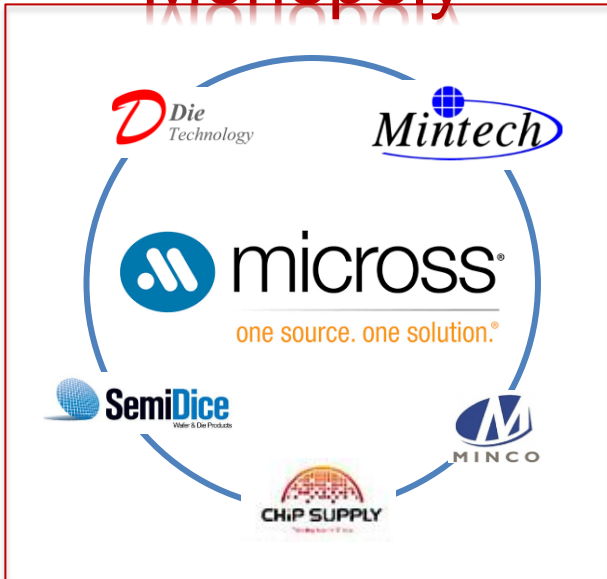


High Voltage Disc	3kV to 20kV/ MIL-PRF-49467 Option	X7R / X5R / X5U / Z5U / NPO
High Voltage Multilayer	500V to 10kV / MIL-PRF-49467 Option	X7R / NPO



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Monopoly



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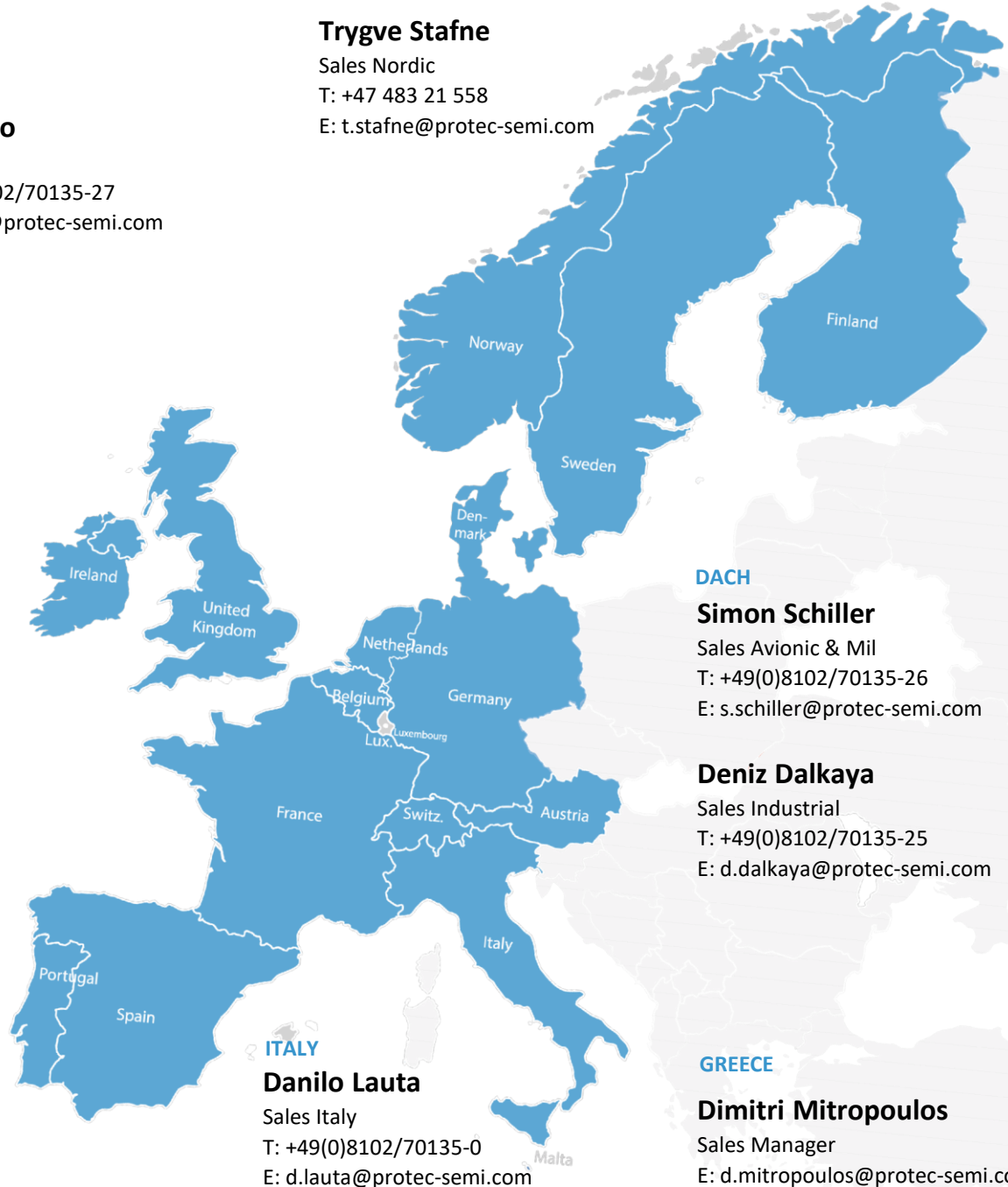
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GREECE

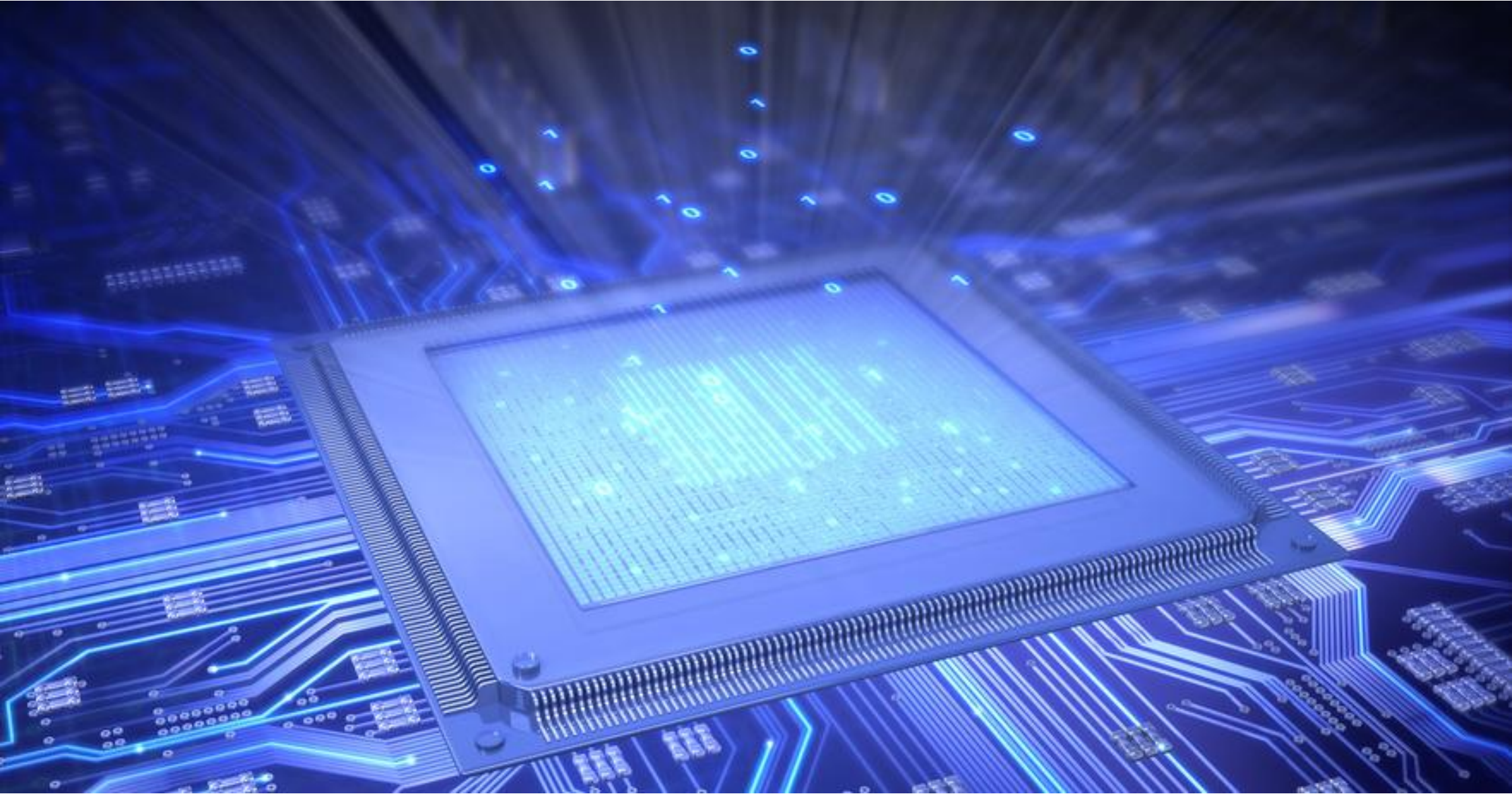
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