



KAMAKA

Electronic Bauelemente Vertriebs GmbH

Hi-Rel Solutions

Avionics

Defence

High Temperature

RF Products

Space

Sales Office North

Robert-Bosch-Strasse 25
25335 Elmshorn
Germany
phone: +49-4121-463-900
e-Mail: schroeder@kamaka.de

Sales Office Central

Montgolfier-Allee 16
60486 Frankfurt
Germany
mobile: +49-179-133-9767
e-Mail: rathgeber@kamaka.de

Headquarters

Ulmer Strasse 130
73431 Aalen
Germany
phone: +49-7361-9662-0
e-Mail: info@kamaka.de



An Infineon Technologies Company

Products	Description
Isolated DC/DC Converters	Power 5W-120W - through hole technology - (THT)- High Reliability DC/DC Converters with Magnetic Coupled Feedback
Operating Temperature	-55°C to +125°C
DC - Input Voltage Range	16V-50V, 30V-80V, 80V-160V, 160V-400V
Single Output Voltage	3.3V, 5V, 6V, 9V, 12V, 15V, 28V
Dual Output Voltage	±5V, ±12V, ±15V
Triple Output Voltage	5V/±12V, 5V/±15V
Case	Metal Case / option: with flange

Manufactured in a facility fully qualified to MIL-PRF-38534, these converters are fabricated utilizing DSCC qualified processes. For available screening options, refer to device screening table in the data sheet. Variations in electrical, mechanical and screening requirements can be accommodated.

ASA and AHV are designed to meet stringent 80V, 0.1 second per MIL-STD-704A without external filtering required	Output Power	Hi-Rel Hermetic				
		Single		Dual	Triple	
	5W	ASA		ASA	-	
	5W	HTB ^{new}				
	6W	ASAP		ASAP	-	
ATS includes MIL-STD-461 (CE03) compliant EMI input filter • Product Development Direction	12W	AHF		AHF	-	
	15W	AHV		AHV	AHV, ATO	
	15W	AHE		AHE	AHFP	
AHP/AFL Series: – Parallel for higher power with equal current/ stress sharing – AHP270/AFL270 offers highest power density in the industry – Strong heritage - AHP/AFL >100K units since intro over 10 years ago.	20W	HTA		HTA	-	
	25W	AHFP	AHE	AHFP	AHE	-
		ATR, ATS		ATS		-
	30W	ATR		ATR		ATR
		ATW		ATW		ATRP
	40W	ATRP		ATRP		HM
	55W	HTH		-		-
	66W	AFL, AHP		-		-
	80W	AFL, AHP		AFL, AHP		-
		90W		AFL, AHP		-
92W	HTM		-		-	
96W	-		AFL, AHP		-	
100W	-		AFL, AHP		-	
108W	AFL, AHP		-		-	
112W	AFL, AHP		-		-	
120W	AFL, AHP		-		-	
		+185°C rated temperature				
		+165°C rated temperature				
DLA SMD part number available						

MIL-Filter for DC/DC-Converters

Product Family	Filter Family	Vin Max	Iin Max	Input Transient	CE03	CS06
ASA, AHF, AMA, AMF	ASF461	50V	0.42A	50V	Y	
All converters except AFL	AFC461	40V	4A	40V	Y	
	AFV461	40V	4A	704A	Y	
	AFM704A	80V	4A	704A	Y	Y
S28	AFH461	40	2A	100V	Y	
ART, ARH, S28	ARF461	80	5A	100V	Y	
AHF, ASA, AMA, AMF	AMH461	50	2A	100V	Y	
AFL28, AHP28	AME28-461	40V	15A	100V	Y	
AFL50	AME50-461	100V	7A	300V	Y	
AFL120, AFL270	AME270-461	400V	1.5A	720V	Y	
AHP270	AME270-461	400V	1.5A	720V	Y	
ATS28	Internal				Y	

EMI Filters are available for design that must be compliant with conducted emission CE03 requirements of MIL-STD-461 - I_{max} 0.42A to 15A



An Infineon Technologies Company

Space DC/DC Converter Class H, K
Isolated and non-isolated

Products	Description
Isolated and non Isolated	Power 5W - 350W
DC/DC Converter Class H, K	RAD Hard & Rad Hard Tolerant
Operating Temperature	-55°C to +125 °C
DC- Input Voltage Range	16V-40V, 30V-80V, 80V-160V, 160V-400V
Single Output Voltage	3.3V, 5V, 6V, 9V, 12V, 15V, 28V
Dual Output Voltage	+/+ 3.3V/5V, +/+1.8V/3.3V, ±5V, ±12V, ±15V
Tripple Output Voltage	+5V/+12V or +5V/ +/- 15V
Control connector+	Remote on/off / telemetry DATA (open design Version)
Adjustment	Voltage & Sync-Frequency & Sense Connector
EMI	Mil-Std.-461-CE03 conducted emission
DCDC with internal Filter	M3G, M3L, M3H, LS, LSO, GH, GHP, EC, ZA, ZB, EA EB, EAR, EC, EAR-T, EGA MA, MB, MAB, MBH, MAH, ML, MAS, MNL, CLP

Output Power	Rad-Tolerant TID: 25-50Krad SEE: 37-60MeV			Rad-Hard TID: 100K-1Mrads SEE: 37-83MeV			
	Single	Dual	Triple	Single	Dual	Triple	Quad
5W	AMA	AMA	-	ARE	ARE MA ML	MA MAB MLN	-
10W	AMF	D	-	S	S	-	-
	-	DH	-	-	MAH	MAH MAS	MAH
12W	AMF	AMF	-	LS	-	-	-
15W	-	-	-	-	MB CLP	MB	-
20W	SBB ⁽²⁾	-	-	LS	MBH	MBH	-
25W	M3L	M3L	-	LS	-	-	-
30W	-	AMR	-	ARH M3H M3G	-	ARM	-
	-	-	-	LS	LS	ART	-
	-	-	-	LSO ⁽¹⁾	LSO ⁽¹⁾	-	-
	-	-	-	SBB ⁽²⁾	-	-	-
40W	M3H	M3H	M3H	M3G	M3G	M3G	-
50W	-	-	-	GH	-	-	-
55W	-	-	-	-	-	EA	-
60W	-	-	-	ZA	CEP	EA	-
80W	-	-	-	ZA	-	-	-
100W	-	-	-	ZA	-	-	-
105W	-	-	-	-	EAR	-	-
120W	-	-	-	GHP	GHP	EAR-T	-
150W	-	-	-	-	-	EB	-
250W	-	-	-	ZB	-	-	EC
300W	-	-	-	-	-	EGA	-
(1)	Includes output overvoltage protection and input current telemetry						
(2)	POL- Converter						

Point of load DCDC Space DCDC Converter
Features SBB Serie:

- 4.5 to 5.5V DC input
- Output rating: 14W to 30W / 14A
- 100Krad, 83 MeV, prompt dose and neutron rated
- Fixed 400KHz Operating Frequency
- Discrete PWM controller
- DLA Qualified SMD Part Number
- Output Voltage 1V, 1.2V, 1.5V, 1.8V, 2.5V, 3.3V
- Typ Eff% up to 89%
- Remote sense / External Sync. / Output Adj. +/-10%
- No external Filtering / OLP / SCP
- Under Voltage Lockout (UVLO)
- Output Status Telemetry (POK)
- Derating per Mil-STD-1547 for space flight
- MTBF > 2.8million hours for space flight environments

Point of load DCDC Space DCDC Converter
Features SBP Serie:

- 3.3V to 12V DC input
- Output rating: up to 20W / 6A
- 100Krad (Si), SEE hardness rated, SEL/SEB/SET/SEGR with LET > 86MeV-cm²/mg
- Output Voltage: Adjustable from 0.8V to 3.3V
- with external Resistor
- Fixed 500KHz Operating Frequency
- Typ Eff% up to 93%
- Remote sense
- No external Filtering / OLP / SCP/ telemetry & Timing
- Adjustable Soft Start and Input Under Voltage Lockout
- Output Sequencing of Multiple Modules via Track and
- Enables Pins
- Derating per Mil-STD-1547 and NASA EEE-INST-002

LS, LSO, M3H, M3L series: MIL-STD-461 compliant filter included
 LSO series also includes OVP and input telemetry



Hi-Rel PWB-based Hi-Rel DC/DC Converters for space digital- and RF-applications.
 High level power management solutions.
 Specific mechanical interface between EPC and RF-part

Pout	DC/DC – Converter	High CS rejection - power input to outputs
up to 10W	MA, MAB, MAH, MB, MBH, ML	Sequencing between positive and negative outputs
10 - 20W	MB, MBH, EA	Low noise outputs (filters and linear post regulators)
20 - 40W	MBH, EA	High efficiency & adjustable main output (high power EPC)
40 - 80W	EA, EB, EBR, EAR, ZA	High efficiency at low voltage / high current
up to 80W	EB, EC, EAR, EGA, ZA, ZB	SPFF regarding output over voltage

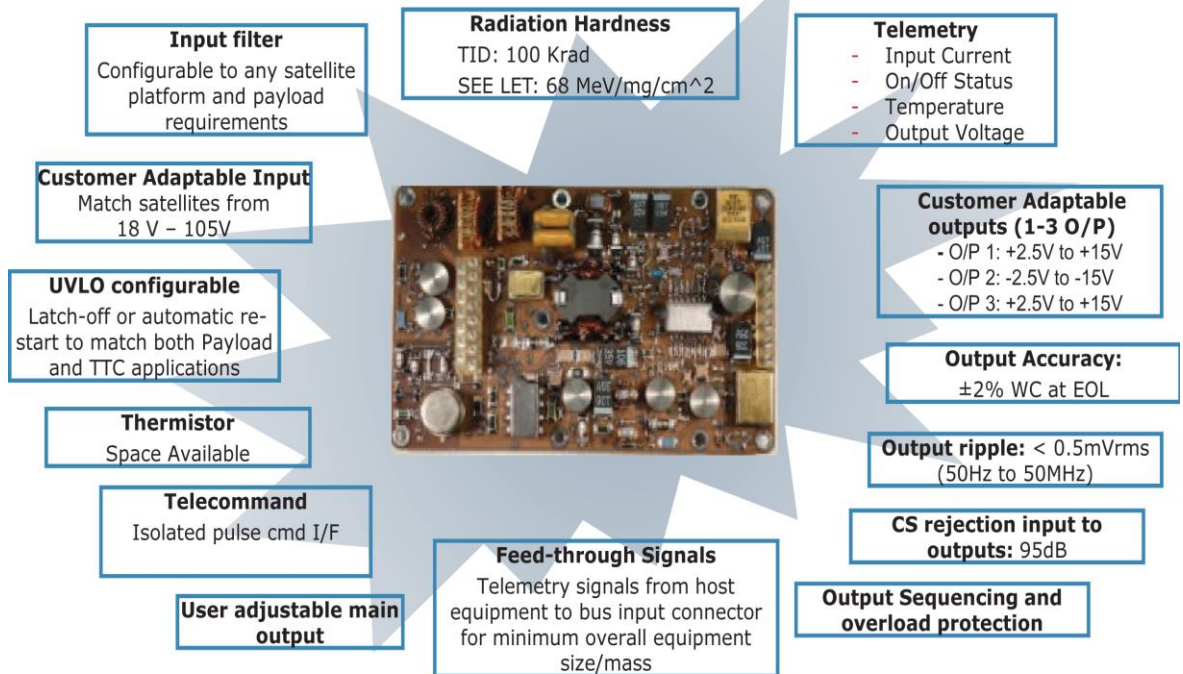
Customer adaptable product platforms

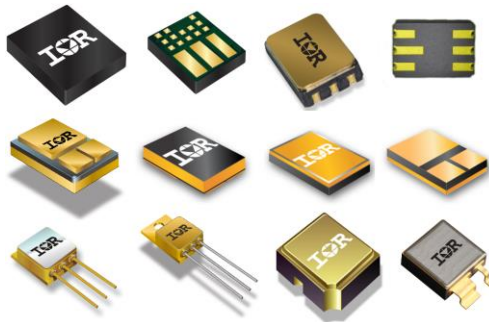
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 High level power management solutions.
 Specific mechanical interface between EPC and RF-part

Pout	DC/DC – Converter	High CS rejection - power input to outputs
5W - 10W	MA, MAB, MAH, ML, MLN, MAS	Sequencing between positive and negative outputs
15W - 20W	MB, MBH, CLP,	Low noise outputs (filters and linear post regulators)
55W - 120W	EA, CEP, EAR, EAR-T, ZA	High efficiency & adjustable main output (high power EPC)
250W - 300W	EC, EB, ZB, EGA	High efficiency at low voltage / high current
		SPFF regarding output over voltage



IRD's customer adaptable product platforms are designed to offer high performance and maximum flexibility. Typical features are:





Military and Space Products

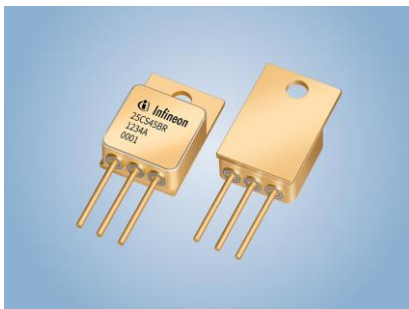
MIL-qualified N-, P-Channel MOSFETs
Logic Level Rad Hard MOSFETs
Radiation Hardened Power N-, P-Channel MOSFETs
Single, Dual & Quad MOSFETs 30 to 600V
RAD Hard MOSFETs SEE= 37, 60, 82, 85, 90MeV,
TID= 100, 300, 500, 1000Krads
Radiation Hardened Solid State Relays Single, Dual, Octal
TID>100Krads, SEE immunity, Class K
High Voltage Gate Driver IC TID>100Krads, SEE= 82MeV
QPL Schottky Diodes Single Device, Doubler Common Cathode
Ultra-Fast Diodes Single Device, Doubler Common Cathode
Ultra LDO-Voltage Regulators, Linear Regulators
EAR99 Space Grade Products
Approvals: MIL-PRF-19500 JANTX, JANTXV, JANS level



Manufacturer of Hi-Rel Space Products ESCC5000 and 5010 qualified HiRel components

Rad-Hard Power MOSFETs (CoolMOS™ Technology)

100V, 150V, 250V in SMD-0.5, SMD-2, TO-254AA, TO-257AA
TID>100Krads (300Krads on request), SEE >LET 55 / 85 MeV
"SAM" are electrically functional samples
"P" are professional level used on bread-boards and EM
"ES" for ESA space level used for full qualified satellite flight modules



Microwave Transistors

Silicon Bipolar Transistor Technology
Supply voltage rating from 4V to 12V
Output power from 20mA to 150mA
Transition Frequency from 6.5GHz to 42GHz

Microwave Silicon Diodes

Small Signal-, Schottky- and PIN-Diodes
 $I_{Fmax} = 120mA$ to 5A, $V_{BR} = 40V$ to 150V, $R_F = 0.9\Omega$ to 10 Ω



Chips (bare die's) available

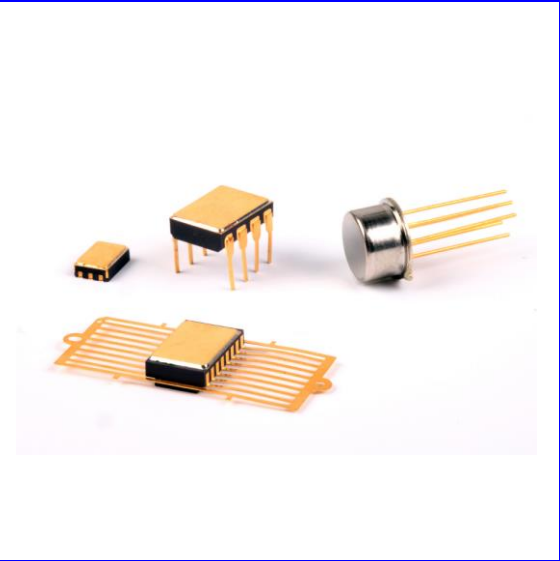
Customer specific screening

Radiation Hard Power MOS, MW Transistors ESA qualification
ESCC qualified products

All products are produced in Europe – no export license required

Radiation Hard Optoelectronics

Space Rad Hard Optocouplers, Emitters, Detectors
 Operating across 100% to 1000%CTR
 Bare Dies tested to TID up to 150Krad(Si)
 Operating Temperatures of -150°C to +125°C
 High Speed-, High Gain-, Transistor-Optocouplers
 Analog and digital output devices
 Single-, Dual-, Quad-Channel Optocouplers
 Hi-Rel Military NATO Stock Numbers available
 Customized products
 Ceramic DIL, SMT LCC packages, Flat Pack, 4-Pin LCC
 Standard Optocouplers available for EM parts
 Applications: Isolation for high-voltage power systems
 ISO 9001:2008, IECQ-CECC (BSI) component approvals compliant
 with MIL-STD-883 and MIL-STD-19500 screening process
 Made in UK – Benefit of being ITAR free



SPACE IC



High-Reliability Hermetic Integrated Circuits

Radiation Hard ICs in BCD SOI for Power Management
POL Converter: 24V 2A DC/DC Buck Regulator IC suitable for
 high efficiency (>90%) POL from 12V Power Input Rails
 LDR TID biased >40krad(Si); -40°C to +125°C
 SEL, SEFI and SEU immune
 Hermetic Ceramic FP-16 Power Package
 Qualification Tested and Screened According to
 ESCC 24600 quality standard
 POL SPPL12420RH registered in EPPL Listing
 Enables efficient & space-saving solutions in POL architecture
 Radiation Test Reports available
 Made in Germany - Benefit of being ITAR/EAR free



Hermetic Ultra-Capacitor Technology D & AA size cells,
 33F to 370F capacitance
 Extreme temperature operation -40 up to +300°C,
 Custom Modules
 Vibration & 500g Shock Resistance,
 Lithium Free – no risk of explosions
 High Cycle Life, 20+ year shelf life, weldable terminals for
 parallel or series connect
Applications: Hi-Rel Avionics, High Temperature Products for
 Oil & Gas

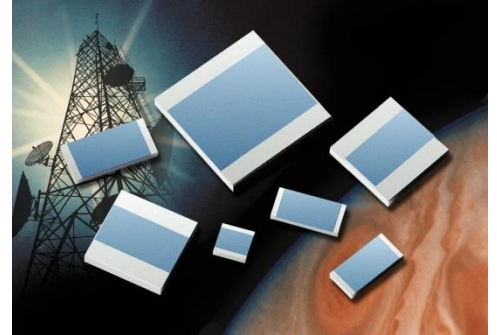


State of the Art, Inc.

State of the Art

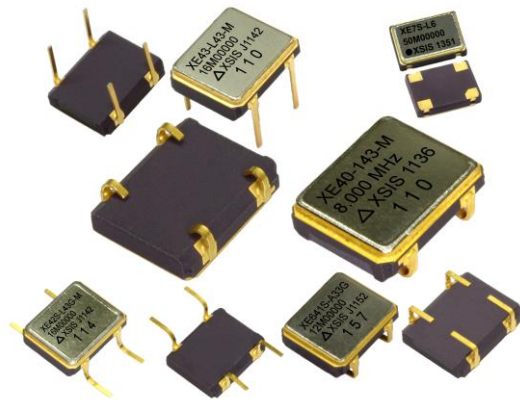
Mission Critical Thick & Thin Film Resistor Products Surface Mount Chip Resistors

Established Reliability and Space Level Chip Resistors
 MIL-PRF-55342 Thick Film C, M, P, R, S, U, V, T Level
 MIL-PRF-55342 Thin Film C, M, P, R, S, U, V, T Level
 MIL-PRF-32159 Zero Ohm Jumpers C, M, T Level
 MIL-PRF-914 Surface Mount Resistor Networks
 Standard Grade Thick Film from 0 Ω to 100 M Ω
 Standard Grade Thin Film from 5 Ω to 10 M Ω
 Solderable, Epoxy Bondable & Wire Bondable Finishes
 High Frequency Chip Resistors up to 20 GHz
 High Power Chip Resistors rated to 200 Watt
 High Voltage up to 5 KV, High Value to 100 G Ω
 Silicon Chip Resistors 5 Ω to 10 M Ω
 Chip Attenuators from 1 to 20 dB
 Thin Film Multi-Tap Attenuators
 Thin Film Platinum Heater / Sensors
 Temperature Variable Chip Attenuators (Second Source to IMC)
 Current Sense Resistors at values as low as 20 m Ω
 Power Moisture Compliant Chip Resistors
 Standard Thin & Thick Film Products are RoHS compliant
 High Temperature Chip Resistors with Termination Style Y and Z
Aerospace, Defence & Medical Applications
 High Reliability Screening Specialist
 Approvals: ISO9001 & AS9100 Certified, MIL-STD-790



Xsis Electronics

Hi-Rel Hybrid Microcircuit Crystal Oscillators



Space Qualified Oscillators, TID, SEL & SET Test Data
 Military Qualified Oscillators 883B Screening
 QPL to MIL-PRF-55310/08, /09, /11, /14, /15, /16, /17, /18, /19, /26
 /27, /30, /33, /34, /35, /36, /37, /38, /39, & /40 parts
 Custom Hi-Rel Screening
 Very High-Temperature Down-Hole
 Ultra High Shock & Vibration Designs
 TTL- LVTL- CMOS- AC/HCMOS- LVHCMOS- ECL, Tristate Output
 Multiple Frequency Outputs, Wide Frequency Ranges
 Multiple Temperature Ranges
 THT Package: CerDIP, TO-5
 Surface Mount: Leadless-, J-Lead-, Gull Wing-Lead-Package
New: Low Voltage 3.3V in 5x7 mm SMD
 Approvals: AS9100, MIL-PRF-55310, MIL-PRF-3098



Custom and mobile portable power systems

Military, Aerospace, Marine, safety & energy storage applications

Soldier Wearable Integrated Power Equipment System (SWIPES)

Aerospace / UAV: Rechargeable batteries

High energy density up to 240Wh/Kg

Military standard and custom Li-Ion rechargeable batteries

Military Tactical & Depot Chargers, Vehicle Lithium-Ion batteries

MIL-810 vibration, shock, thermal cycles, humidity, transportation

UN 38.3 Recommendations on the Transport of Dangerous Goods

Battery Management Systems (BMS) and Power Electronics

Renewable energy storage systems and Micro-grid



**EVANS
CAPACITOR
Company**
www.evanscap.com



EVANSCAPS - POWER WHEN YOU NEED IT!

**EVANSCAPS have the highest energy and power density capacitors
Military grade Tantalum Wet Capacitors - MTBF>5,000,000 hours**

10V-125V with over 100 capacitance ratings in broad range of form factors

Very low ESR, Very high current handling capability. Applications range from Avionics/Power hold up, Laser pulse power, Phased array radar pulse power, 200°C+ models available for oil and gas exploration.

THQ Hybrid Capacitors 1.40" dia	4,500µF to 200,000µF (10V-125V) 85°C (6V-75V) 125°C
TDD Hybrid Capacitors 1.40"square	1,500µF to 30,000µF (50V-125V) 85°C (30V-75V) 125°C
THS3 Hybrid Capacitors	4,200µF to 200,000µF (10V-125V) 85°C (6V-75V) 125°C
THQ & THS Hybrid Capacitors	Stud Mounting SM00 – SM05
HyCap Series Hybrid Capacitors	68µF to 2,200µF (25V-125V) 85°C (15V-85V) 125°C
HyCap Series Hybrid Capacitors	Standard DSCC 93026 & DSCC 10004 ratings
HyCap HT Hybrid Capacitors	68µF to 1,500µF (30V-75V) 175°C (25V-62V) 200°C
THQA2 Hybrid Capacitors	215µF to 10,000µF (10V-125V) 85°C (6V-75V) 125°C
THQA2-HT Hybrid Capacitors	215µF to 560µF (37.5V-62.5V) 175°C (30V-50V) 200°C
TQS2 Shock hard Hybrid Capacitors	1,600µF to 13,000µF (8V-50V) 85°C (4.8V-30V) 125°C
THQ3 Hybrid Capacitors	1,100µF to 50,000µF (10V-125V) 85°C (6V-75V) 125°C
3STHQ3 or 3PTHQ3 Series - 3" Pack	1,100µF to 450,000µF (10V-300V) 85°C (6V-180V) 125°C
6PTHQ3 Series - 6" Pack	20,000µF to 900,000µF (10V-125V) 85°C (6V-75V) 125°C
Capattery Series EDLC	0.47F to 1.5F (5.5V -25V) -55°C to +85°C
HQ Series Hybrid Capacitors	1,100µF to 50,000µF (10V-125V) 70°C

The design and manufacture of capacitors and capacitor modules for Aerospace and Defence customers
Approvals: ISO 9001:2008, AS 9100:2009, in accordance with the requirements of AS9104/1:2012



Products	Description
Isolated DC/DC Converter	MBH Series 1100 to 2100 Watt
MIL-STD-1275B / MIL-STD-461E	Custom and Standard Solutions for Industrial and Mil- Applications
Input Voltage	10V-16VDC (1100W)
Output Voltage	28Vdc
Input Voltage	23V-32Vdc (2100W)
Output Voltage	12V & 13.5V
Efficiency	97%
Environment	Ideal for harsh Shock and Vibration Environments

Isolated-Digital DC/DC Converter	WDE Serie 75 Watt 1/8 Brick Solution
Input Voltage	4:1 / 9.0-36VDC / 18-75V DC
Output Voltage / 24V Input	5V, 12V, 24V, 28V, 48V
Output Voltage / 48V Input	24V, 28V, 48V
Telemetry-Data	Real Time Performance Data VIA PMbus th
Adjustment	Digital configurable voltage, current and over temperature & Sense Connectors
Control connector	Remote on/off
Evaluation Board	WDE24-1, WDE24-2, WDE48-2 please contact Kamaka

Isolated-Analog DC/DC Converter			Brick Solution 75 Watts and up to 1000 Watts			
Series	Watts	Package	V in Nom	V out	V in Range	Case/Size
QH	75	¼ Brick	24, 48	3.3 , 5, 12, 15, 24	2:1	1.45"x2.28"x0.52"
HEW	100	½ Brick	24, 48	3.3, 5, 12, 15, 24	4:1	2.4"x2.28"x0.55"
HEW	150	½ Brick	24, 48	5, 12, 15, 24	4:1	2.4"x2.28"x0.55"
GX	200	½ Brick	28	15, 24	2:1	2.4"x2.28"x0.55"
MTW	360	½ Brick	24	12, 15, 24, 28	4:1	2.4"x2.50"x0.55"
MXW	500	½ Brick	24	12, 15, 24, 28	4:1	2.4"x2.50"x0.55"
FXW	1000	Full Brick	24	24, 28	4:1	4.7"x2.50"x0.55"
FXP	1000	Full Brick	24	24, 28, 48, 53	4:1	4.7"x2.50"x0.55"
HD DUAL	75	½ Brick	24, 48	2.5 , 3.3, 5	2:1	2.4"x2.28"x0.55"
HE Triple	75	½ Brick	24, 48	3.3, 5,+/-12, +/-15, +/-17	2.1	2.4"x2.28"x0.55"
LT Triple	75	½ Brick	24	1.5, 1.8, 2.5, 3.3 ,5	2:1	2.4"x2.28"x0.55"
Control Connector	Remote on/off					
Adjustment	Output voltage +/-10% & Sense Connectors					
EMI	Filter for 24V + 28Vdc nom. input voltage MIL-STD-461-E at full load 200W / 28V					
Load Share Module	LSL	¼ brick package, Dual input load sharing, DCDC trim function ; 60° output				
Hold Up Module	HU-28	¼ / ½ brick package 50ms hold-up time without external capacitor				



- Power distribution box-landed/ground based/portable
- X-Band/L-Band transmitters: radar sets
 - Autonomous robotic systems
 - Man packed radio/satellite terminals
 - RF inhibitors/jammers (EW)
 - Rugged computers
 - Thermal imaging

- Full Brick - 1000 Watt FXP Parallel
- Full Brick - 1000 Watt FXW Single
- 1/2 Brick - 500 Watt MXW Single
- 1/2 Brick - 360 Watt MTW Single
- 1/2 Brick - 200 Watt GX Single
- 1/4 Brick - 250 Watt QMW Single
- 1/4 Brick - 150 Watt QSW Single
- CBAM™-Power Quality (MIL-STD-1275B)
- EMI Filters (MIL-STD-461E)
- MBH 1100-2100 Watt with CAN-Bus option

- Military-COTS, demanding, mission critical apps.
- Ultra-wide input range 4:1, 9-36V, 18-75V for battery powered/ back up applications
- High efficiency (up to 96.5%) for energy saving and easier thermal management
- High Power Density: 150W-250W @ quarter brick, 360W-500W @ half brick 1KW @ full brick : for board space saving
- Case operating temp.: -40°C to +100°C, extended -55°C to +110°C
- Shock and Vibration designed to meet MIL-STD-810G
- Complementary front end modules comply with MIL-STD-461E & MIL-STD-1275B
- Outputs: single to triple output voltages
- Isolation: 2250VDC (i/o), up to 4250VDC available
- Mounting: PCB (Bricks), Chassis
- Custom solutions available •5 year Warranty •EAR99 classified

100% Testing under all operating conditions 5 Year warranty

**Data Acquisition Products since 1970
High-Temperature, Medical, Military, Space**

Standard Products

A to D-Converters: 7 to 8-bit CMOS Flash up to 20MSPS
Stand-alone 12-bit with 2 to 20 μ sec conversion rate

Sampling A to D-Converters: 12 to 24-Bit up to 20 MSPS

D to A-Converters: 8, 10, 12, 16-bit up to 250MHz with input latching
COTS: DAC-1412 14-bit 125MHz D-to-A-Converter, 28-Pin Plastic TSSOP

Single-Package Data Acquisition Systems 12-bit

Input Multiplexer, Instrumentation Amplifier, S & H Amplifier, A/D-Converter and various interface logic – fully qualified with screening

CCD Signal Processor / Imaging Converters: 12, 14, 16, 18-Bit ADC with integrated Correlated Double Sampler for easy interface with CCD

Stand alone CCD Image Converters: Functionally complete 12 to 18-bit resolution ADCDS converter family

Sample & Hold Amplifiers: from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions) with acquisition speeds from μ s to low tens of ns

Precision Voltage references

1.024; 1.25; 2.048; 2.5; 3.0; 3.3; 4.096; 5.0V

LDO Linear Voltage regulators: -15V; +15V ; from -55 to +125°C

4- & 8-CH Multiplexers: from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions) with fast settling time speeds in the low tens of ns

Amplifiers: 70 to 200ns from -55 to +125°C

High Temperature Products:

Amplifiers, Correlated Double Sampling Amplifiers, A/D & D/A-Converters
Operating Temperature Range: -55 to +200°C

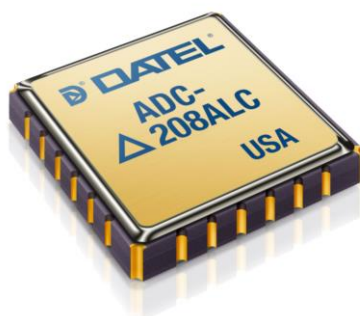
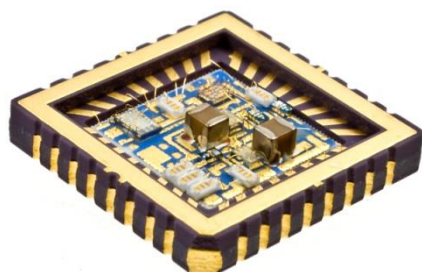
Custom solutions: Design of modified products for digital imaging, industrial, medical, aerospace, Hi-Rel Defence applications

Obsolescence Solutions

Reverse Engineering
Process Porting & Device Replication
Obsolete component replacement, Device Replication

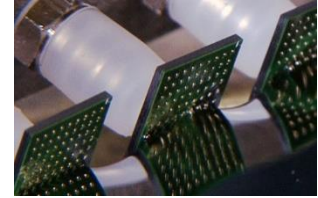
Standard Microcircuit Drawings: SMD5962-xxxx, DSCC/DLA certified

Approvals: MIL-883 certified components



Component Obsolescence Challenges

Robotic Hot Solder Dip – Compliance with RoHS directive
 Non-availability of Tin Lead components
 Life-time buy opportunity (Long Term Packaging)
 BGA Reballing for the Conversion of tin-lead
 Component Harvesting – removing high cost obsolete components from a PCB
 Lead Preparation, Lead Reconditioning, Lead Attach
 Forming and Cutting of Pins
 Gold Mitigation – Removes gold and replaces it with SnPb.
 Elimination of Tin-Whiskers through tin-lead-alloy
 Solderability Testing, X-Ray Fluorescence Analysis (XRF)
 Fine and Gross Leak Testing
 Additional Services: Kitting, Tape & Reel, Engineering Support
Applications: Aerospace, Defence, Implantable Medical, Transportation
Approvals: AS9100, ISO 9001 registered, ANSI/ESD S20.20-2014



Delivering High-Reliability Semiconductor Solutions Discontinued and End of Life industrial and military parts

QML Class Q and Class V certified manufacturer
 QML approved products
 New chip redesign to finished IC, Original Form, Fit & Function
 Design, Fabrication, Assembly, Test, Burn-In, Full Qualification
 Analog & Interface IC's: Amplifiers, TTL-, ECL - Logic IC's
 A/D & D/A Converters
 Memories: CPLD Dual Port RAM, EPROM, EEPROM, SRAM
 Microcontrollers & Microprocessors
 Programmable & Discrete Logic IC's
 Custom IC solutions for obsolete parts
 Wafer & bare die banking

EOL products: Atmel, Cypress, Fairchild, IDT, Lattice, Maxim
 Micron, NSC, Philips, Peregrine, Raytheon, STM, Zilog
Applications: Aerospace, Defence, Military, High End Industry
 Transportation

Approvals: AS9100, MIL-STD-883, MIL-1835, MIL-PRF-38535





Professional Triple Redundant Autopilots^{mp}, **MicroPilot Autopilots Fly Multi-Rotors**
LRC with Radio Modem, LRC Base (Ground), LRC Airborne Unit, True HWIL
Board & Enclosed Autopilots, Simulation for the UAV, Horizon Ground Control UAV
Applications: UAV - Fixed Wings, Helicopter, Airborne

Our Service

KAMAKA WAS ESTABLISHED in 1992

Strategic Obsolescence Management

Life Cycle Management
Long Lifetime Program up to 25 years
Long Term Storage of obsolescence products
Obsolete Parts Replacement
Requirements Engineering
Supplier Risk Management

Part Procurement

Last Time Buy, EOL-, PCN-Service
Inventory Management & Kitting
Worldwide access to allocation and obsolete products

Packaging Solutions

Custom packaging of bare die
Custom Multi Chip Module

Quality Agreements

Anti-Counterfeiting Program
AQL spot checks according to DIN/ISO 2859-1
Avoiding Counterfeiting parts - only original parts
Counterfeit Analysis
Components Upscreening Program
Qualified Visual & Electrical Test Reports
Traceability is guaranteed
You will get a manufacturer CoC for re-fabrication parts

Member of



Total Quality Management

DIN EN 9120:2016 technically equivalent to AS9120B and SJAC9120A
DIN EN ISO 9001:2015
DIN EN 61340-5-1 ESD compliant storage & handling process

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