

# endrich news

www.endrich.com

Electronica 2016 – Thank you for your visit!

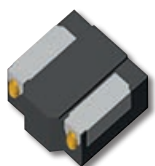


Dear readers,

We had a very successful exhibition at the Electronica in Munich. Many new products found big attention with our visitors. Last month we sent you our newest shortform catalogue – please do not hesitate to contact us for our new products.

Best regards  
W. Endrich

# FLAT AND EFFICIENT SMD POWER CHOKES– HC SERIES



**The new ABC HC Series** are high efficient chokes with focus on lowest copper loss by using a flat enamelled copper wire with  $\alpha$ -winding as well as lowest core loss by applying a special metal alloy on iron power base with partly amorphous structure.

## Features:

- Special core material consist of metal alloy on iron powder base with partly amorphous structure
- Magnetically shielded for optimal EMC
- Value range 0.47 ... 4.7  $\mu$ H
- Extremely low DCR by using flat copper wire with  $\alpha$ -winding
- Optimised for high continuous current (low temperature rise)
- Wide terminals for optimal connection
- Semi- automatic manufacturing for best quality and flexibility

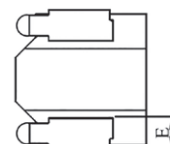
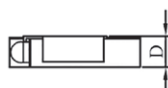
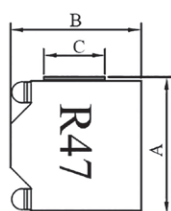
## Applications:

- DC/DC converter in consumer and industrial electronics
- Portable devices
- Applications that require a flat case

## Service:

- Datasheets under [www.endrich.com](http://www.endrich.com)
- Cross Reference and layout comparison available
- Free of charge samples on request
- 3D Model, Spice data downloadable

	SIZE (MM)	HC0312	HC0412	HC0512	HC0612
<b>A</b>	$3.4 \pm 0.2$	$4.4 \pm 0.2$	$5.4 \pm 0.2$	$7.1 \pm 0.2$	
<b>B</b>	$3.1 \pm 0.2$	$4.1 \pm 0.2$	$5.1 \pm 0.2$	$6.7 \pm 0.2$	
<b>C</b>	1.6 ref.	2.0 ref.	2.50 ref.	3.00 ref.	
<b>D</b>	1.2 max.	1.2 max.	1.2 max.	1.2 max.	
<b>E</b>	$0.95 \pm 0.1$	$1.1 \pm 0.1$	$1.2 \pm 0.1$	$1.65 \pm 0.1$	



## HIGH POWER THIN FILM CHIP RESISTORS – PRG/HRG SERIES



The new Susumu high power thin film chip resistor are designed to meet the high power rating that applications like inverter, DC motor driver or automotive electronics require. Being optimized for high power handling capability, PRG and HRG series bring also all the well known advantages of the thin film technology such as tight tolerance, excellent TCR, very high reliability and low current noise with them.

### Features:

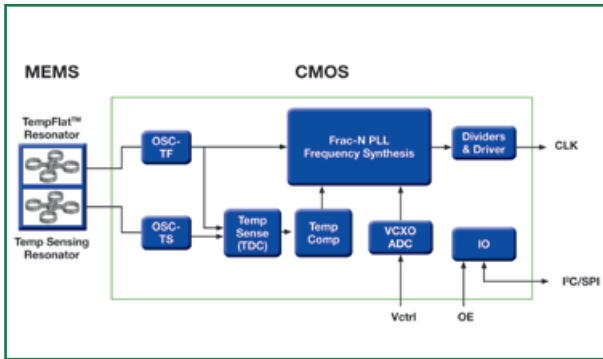
- PRG with long side terminal
- HRG with wider short side terminals
- Full AEC-Q200 compliant
- TCR 25 ppm/K to 50 ppm/K (10 ppm/K on request)
- Very high reliability / waste gas proof
- Can reduce the board space and/or number of components used

### Applications:

- Automotive electronics, e.g. LED Lighting
- DC Motor Drivers
- Inverter
- Robotics
- Industrial controls
- Suitable to use in snubber circuits

	TYPE	POWER RATINGS (W)	TEMPERATURE COEFFICIENT OF RESISTANCE (PPM/°C)	RESISTANCE RANGE Ω	RESISTANCE TOLERANCE / ±0.1% (B)	RESISTANCE RANGE Ω	RESISTANCE TOLERANCE / ±0.5% (D)	MAXIMUM VOLTAGE	OPERATING TEMPERATURE	PACKAGING QUANTITY
<b>PRG2010</b>	0.5	+25(P) +50(Q)	47≤R≤25k	10≤R≤25k 2.5≤R≤25k	75V	-55°C - 155°C			T5	
<b>PRG3216</b>	1.0	+25(P) +50(Q)	47≤R≤100k	10≤R≤100k 2.5≤R≤100k	100V					
<b>PRG5020</b>	1.5 ... 2.0	+25(P) +50(Q)	47≤R≤200k	10≤R≤200k 2.5≤R≤200k	150V					
<b>PRG6432</b>	2.0 ... 3.0	+25(P) +50(Q)	47≤R≤250k	10≤R≤250k 2.5≤R≤250k	200V					
<b>HRG3216</b>	1.0	+25(P) +50(Q)	47≤R≤100k 47≤R≤100k	10≤R≤100k 10≤R≤100k	200V					-55°C - 155°C

# HIGHEST ACCURACY WITH MEMS OCZILLATOR USING ELITE™ – PRECISION SUPER-TCXO'S/VCTCXO



## Elite is an innovative MEMS timing Platform for precision TCXOs, VCXOs, and low jitter oscillators.

This platform leverages SiTime's unique DualMEMS™ architecture with TurboCompensation™. Elite-based precision Super-TCXOs and oscillators are engineered to solve deep-rooted timing problems in high-performance applications such as telecom and networking equipment. Elite products deliver the most stable timing even in the presence of environmental stressors. With SiTime's Elite Platform, telecom and networking equipment can deliver the highest performance, best reliability and the highest quality of service under real life operating conditions. Elite products are ideal for networking, server, storage and telecom (NSST) equipment. Elite products are well suited for other high reliability applications such as test instrumentation,

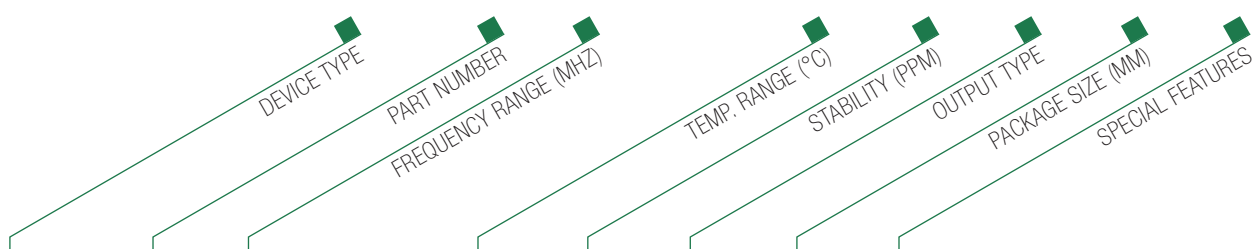
smart power grid, high precision GNSS/GPS positioning for automotive ADAS, avionics, surveying and precision farming.

## How does Elite work?

The Elite Platform combines the world's most accurate temperature sensor, with a proprietary temperature compensation scheme and a low-noise frequency synthesizer to deliver exceptional dynamic stability, ultra-low jitter, wide frequency range and programmability.

## Three key elements of the Elite Platform include:

- Robust, reliable, and proven TempFlat MEMS™ that eliminate activity dips and enables 30 x better vibration immunity than quartz
- DualMEMS temperature sensing with 100% thermal coupling that enables 40 x faster temperature tracking, ensuring the best performance under airflow and rapid temperature changes
- Highly integrated mixed - signal circuits with on-chip regulators, a TDC (temperature to digital converter) and a low-noise PLL that delivers 5 x better immunity to power-supply noise, 30 uK temperature resolution (10x better than quartz), support for any frequency between 1 and 700 MHz, and 0.23 ps jitter



## KEY FEATURES AND SPECIFICATIONS OF ELITE PRODUCTS

Product Type	Part Number	Frequency Range (MHz)	Temp. Range (°C)	Stability (PPM)	Output Type	Package Size (mm)	Special Features
Precision Super-TCXO	SiT5356	1 to 60	-20 to 70	±0.1 to ±0.25	LVCMOS Clipped Sine Wave	SOIC-8: 6.0 x 4.9	-40 to +105°C 1 to 5 ppb/°C ΔF/ΔT 10 °C/min temp ramp 3e-11 ADEV, 1 0 sec stride No activity dips, No micro jumps 12C programmability (option)
	SiT5357	60 to 220					
Super-TCXO	SiT5155	10 standard GNSS frea.	-40 to 85	±0.5 to ±2.5	LVCMOS Clipped Sine Wave	SOIC-8: 6.0 x 4.9	-40 to +105°C 1 to 5 ppb/°C ΔF/ΔT 10 °C/min temp ramp 3e-11 ADEV, 1 0 sec stride No activity dips, No micro jumps 12C programmability (option)
	SiT5156	1 to 60					
Differential Oscillator	SiT5157	60 to 220	-40 to 105	±10 to ±50	LVPEC LVDS HCSL	QFN: 3.2 x 2.5 7.0 x 5.2	0.1 ps jitter, Ethernet mask 0.02 ps/mV PSNR
	SiT9365	32 standard frequencies	-20 to 70				
	SiT9366	10 to 220	-40 to 85				
Differential	SiT9367	220 to 700	-40 to 95	±10 to ±50	LVPEC LVDS HCSL	QFN: 3.2 x 2.5 7.0 x 5.2	±25 to ±3600 ppm pull range 0.1% pull range linearity 0.1 ppb/g vibration resistance
	SiT3372	10 to 220	-40 to 95				
Differential	vcxo	220 to 700					

## PART 1 – ELECTRONICA 2016 – LINE UP RECOMMENDED SAW FILTER FOR GNSS



### TAI-SAW Technology CO., LTD

Former Motorola employees founded TST in 1997. TST is now recognized as the leading SAW (surface acoustic wave) device supplier in Taiwan, as well as the key OEM/ODM supplier of SAW device in the world.

**Products:** BAW (Bulk Acoustic Wave) devices and modules (Xtal, XO, VCO, VCTCXO ... etc).

P/N	FREQUENCY (MHZ)	INSERTION LOSS (dB)	BAND WIDTH (MHz)	SIZE (mm)
<b>SAW FILTER (APPLICATIONS: GPS, GLONASS, GALILEO, BEIDOU, Wearable Device)</b>				
TA0757B (GPS band)	1575.42	0.9	2	1.4 x 1.1
TA0757 AB (GPS band)	1575.42	0.9	2	1.4 x 1.1 *AEC-Q200
TA 1425A (GPS band)	1574.42	0.9	2	1.4 x 1.1
TA0440A (Car Antenna)	1575.42	2.9	2	3.0 x 3.0
TA1343A (GPS+GLONASS+GALILEO+BEIDOU)	1583	1.2	46.79	1.4 x 1.1
TA1343B (GPS+GLONASS+GALILEO+BEIDOU)	1583	1.2	46.79	1.4 x 1.1 *AEC-Q200
TA1661A (GPS+GLONASS+GALILEO+BEIDOU)	1583	2.1	46.79	1.4 x 1.1 *AEC-Q200
TA1267A	1588.655	1.25	34.47	1.4 x 1.1
TA1267E	1588.655	1.25	34.47	1.4 x 1.1 *AEC-Q200
TA0676A	1592.5	2.6	43	3.0 x 3.0
TA 1658A (GNSS)	1582.4	1.7	46.61	3.0 x 3.0
TA1954A (GPS+GLONASS+COMPASS)	1582.47	1.2	46.84	1.1 x 0.9
TA1804A	1582.469	1.1	46.834	1.1 x 0.9
TA1442A	2492	1.55	5	3.0 x 3.0
TA1901A	1587.5	2	57	2.0 x 1.6
TA1785A	1583	1.8	46.79	3.0 x 3.0 *AEC-Q200
TA1745A	1583	1.8	46.79	2.0 x 1.6

P/N	FREQUENCY (MHZ)	NOISE (dB)	GAIN (dB)	SIZE (mm)
<b>FRONT END MODULE</b>				
TN0081A (GPS+GLONASS)	1575 ... 1606	1.65	18.5	2.5 x 2.5 x 0.535
TN0089A (GPS+GLONASS+Beidou+Galileo)	1575	1.5	15.5	1.5 x 1.1 x 0.39
	1597-1606			
	1559-1591			

## ENDRICH COMPONENTS LINK DEVELOPMENT ENVIRONMENTS FOR IOT SOLUTIONS



**Following the principle:** we not only talk about solutions, we help our customers to make it happen, an IoT application board was set up by FAE's / product managers of Endrich Bauelemente GmbH at the trade fair Electronica 2016.

The task was to transmit a sensor signal to an internal WiFi network and to trigger a silent alarm. Further more send the alarm message to the WorldWideWeb and generate an email on a free account. This message can be displayed on smartphone or Tablet PC, which is not in the vicinity of the panel.

In this application example, serial data, of an **industrial controller, SmartHome, alarm system, lightning control** and other application areas are used, and transmitted via an internal and external wireless network.

### Different development environments have been used to realize the demonstration:

#### 1. External network:

As alarm generator the development environment of the GridEye sensor from manufacturer Panasonic, is used. This consists of a 64 temperature sensors, 8\*8 thermopile elements, and thus outputs a 64 bit matrix.

The data is transferred to the WiFigurator, the software kit of the Panasonic WiFi module PAN9320, via the USB interface of the sensor board.

This development board embedding the Wifi module PAN9320, acts as a server and recognise the alarm message. The module works as a client in an existing WiFi topology, which is connected to the internet. Via its router, an email with the alarm message is sent to a WEB address, and can be read by a dedicated Tablet PC or smartphone.

#### 2. Internal network:

In parallel, the development environment, in the case an access point, sends the alarm message via a WiFi tunnel to a second development environment consisting of the same hardware. This sends the signal via the UART to a 32 bit  $\mu$ Controller. In our case the HT32F1765 of the manufacturer Holtek.

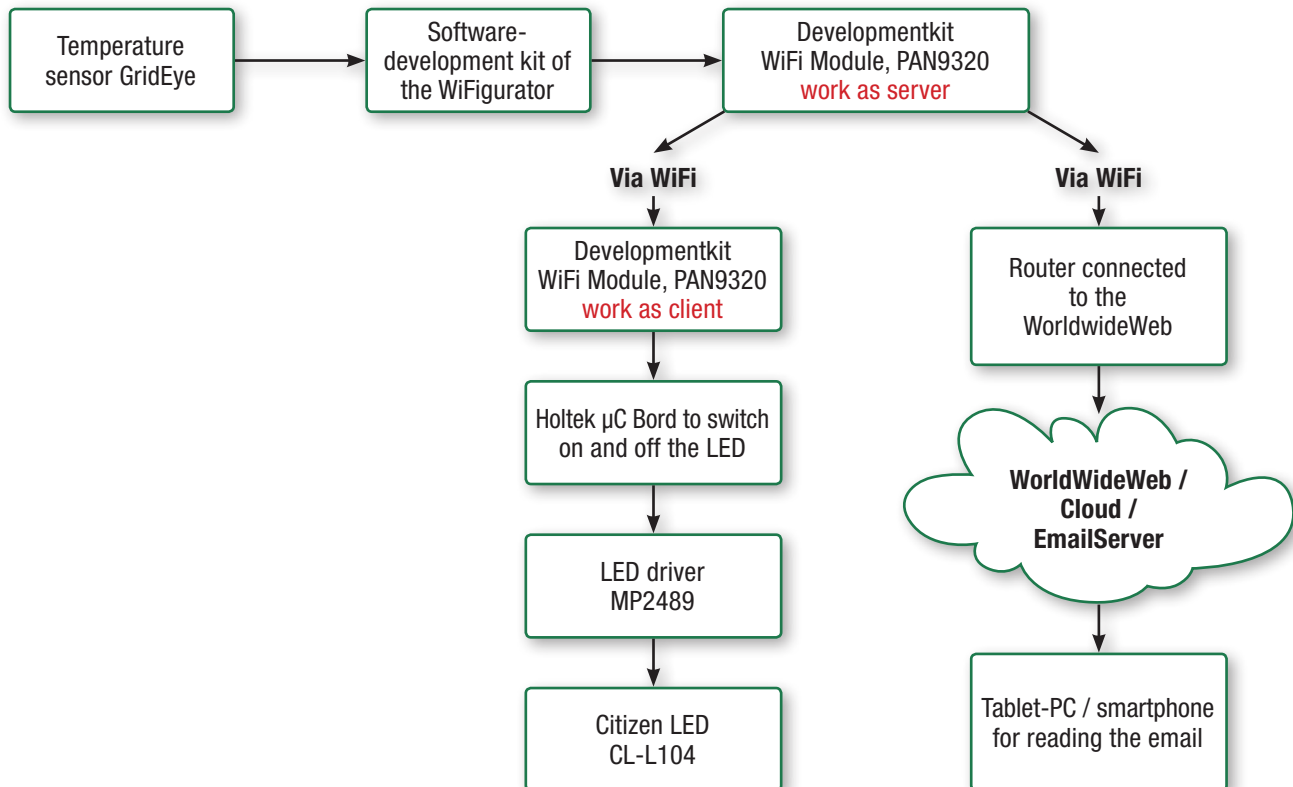
After the UART signal is received, the  $\mu$ Controller switches a GPIO, which responds to a LED driver, MP2489 from our partner Monolithic Power Systems.

This drives the Citizen LED CL-L104, which illuminates the panel brightly by a light output of 100 lumen with a power consumption of 3 watt.

The second development environment of the GridEye sensor provides the data to the development software of the kit, which is based on a Windows-based computer and show the infrared image on a monitor. It's a 17.0 inch display with a capacitive touch sensor of the manufacturer Ampire.

## ENDRICH COMPONENTS LINK DEVELOPMENT ENVIRONMENTS FOR IOT SOLUTIONS

### Blockdiagram



### Used products of the application, which are available at Endrich Bauelemente GmbH:

- **PAN9320 / WiFi Modul, Panasonic**

Standards: IEEE802.11 b,g,n  
TCP/IP and Accesspoint, 1 MB Flash  
for customer Application  
and WebServer on Bord

- **Grid Eye Sensor, Panasonic**

with Bluetooth4.1 Smart Module PAN1740,  
Sensor:  
Digital Output, I<sup>2</sup>C / Interrupt Signal output  
64 Thermopile Elements, 8 bit to 8 bit

- **µC, HT32F1765, Holtek**

Up to 128 k x 8 Flash and 64 k x 8 SRAM are integrated  
Powersupply 2,7 V up to 3,6 V possible  
System Clock: up to 72 MHz

- **LED Treiber, MP2489, Monolithic Power Systems**

Internal 65 V MOSFET  
Wide 6 V to 60 V Input Range  
≥1 A Output Current  
High Efficiency (>95%)

- **LED, Citizen**

White power LED for general lighting.  
General Color Rendering Index Typ. 85 type.  
6 Watt package  
Correlated Color Temperature 3000 K

- **Monitor / Display, Ampire**

17,0 Zoll Diagonale  
1280 x 1024 dots, 850 cd/m<sup>2</sup>  
capacitive Touchsensor

## ICR18650 IN STABLE STEEL CASE WITH PROTECTION DEVICES



**EVE Energy Co. Ltd (EVE)** provides the new ICR18650, a cylindrical lithium rechargeable battery, which – due to its features – is usable in wide areas of application and offers a long cycle life (> 1,000 cycles).

The robust steel case of the ICR18650 is welded by laser and hermetically sealed, to guarantee leakproofness. EVE cells are equipped with safety vents as a standard feature to ensure the highest level of safety. The design is optimized technically to enable the usage in most diverse applications. The ICR18650/26V (Vehicle) is developed especially for applications around e-mobility, whereas the ICR18650/20P (Power) is designed for power tools.

The production of the cells is approved by ISO/TS 16949. The delivery time amounts to 10 – 12 weeks. Samples are immediately available from stock in Nagold.

### Certifications:

- UN38.3
- UL1642
- UL2054 (available on request)
- IEC62133 (available on request)

PART NO.	CAPACITY	VOLTAGE (V)	CYCLE LIFE	MAX. CONT. DISCHARGE CURRENT (A)	SIZE
<b>FRONT END MODULE</b>					
<b>18650/26V</b>	2550 mAh	3.6	>1000	7.65	18 x 65 mm
<b>18650/20P</b>	2000 mAh	3.6	>1000	20	18 x 65 mm

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