

endrich news

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New Partnership for Marketing Innovation: Endrich signs distribution agreement with SiTime Corp. for MEMS Timing Products

Nagold, June 2014

The Endrich Bauelemente Vertriebs GmbH (www.endrich.com) has extended the sales program to MEMS oscillators from SiTime Corporation. The distribution agreement covers the complete oscillator program from the market leader for MEMS-based oscillators.

With over 200 million produced oscillators with MEMS resonators is SiTime innovation driver and the clear market leader in the field of silicon-based MEMS technology for timing applications. Due to the enormous innovation SiTime is considered one of the fastest growing companies in the semiconductor industry. With effect from 05. June 2014 Endrich Bauelemente Vertriebs GmbH supports the complete range of SiTime in Germany and in several other European countries.

In addition to the standard oscillators (XO) comprises the mature product portfolio

- Spread-Spectrum Oscillators (SSXO)
- Voltage-Controlled Oscillators (VCXO)
- Digital Controlled Oscillators (DCXO)
- Temperature compensated Oscillators (TCXO)
- Clock generators (with multiple outputs)
- Timing solutions in the range of 32.768 kHz.

The purely silicon-based timing solutions of SiTime are clear superior the conventional quartz-based solutions in terms of sensitivity such as shock (50,000 g) or vibration (70 g). The very linear frequency drift at temperature changes and stability in the temperature range can also bear the comparison with quartz-based products. Not only the technical advantages cause the rapid spread of MEMS oscillators, also the standard semiconductor fabrication process and high-volume plastic housing ensure the highest reliability, shortest delivery time and cost savings.

Shock and vibration resistance, coupled with the frequency stability of the temperature range of $-40^{\circ}\text{C}/-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, predestine these products for use in the automotive sector.

SiTime especially launched for this market AECQ100-qualified product line SiT8924/5 (2.0mm×1.6 housing forms to 7mm×5mm) and SiT2024/5 (SOT23-5 package) for frequencies in the range 1 MHz to 137 MHz.

„We are very pleased to be working with our Californian partner SiTime in the field of MEMS-based oscillators and look forward to presenting our customers with the quality products of SiTime“ says Dr. Mathias Würth, Managing Director of Endrich Bauelemente Vertriebs GmbH.

About SiTime Corporation

SiTime, an analog semiconductor company, is revolutionizing the timing industry with silicon MEMS-based oscillators and clock generators. Their timing solutions are rapidly replacing legacy quartz crystal products by offering higher performance and reliability at a lower cost.

SiTime was founded in 2005 and headquartered in Sunnyvale, California.

With the robust MEMS resonators and high performance analog ICs, SiTime has developed breakthrough solutions that overcome the limitations of quartz devices. The oscillators are 100% drop-in replacements for quartz oscillators without any design changes. Plus, the programmable architecture enables the most flexible products with more features and ultra fast lead-times. SiTime is enabling the miniaturization of electronic products. For new designs or re-design, customers can use SiTime oscillators in the industry's smallest packages – as small as 1.5 mm×0.8 mm.

INFRARED EMITTER DIODE IRP3016V24-E5 – SIDE VIEW PACKAGE

The **IRP3016V24-E5** is a GaAlAs infrared LED in a small SMD package. The device has a peak wavelength of 940nm LED spectrally matched with phototransistor or photodiode.

FEATURES

- » Small side view package 3.0×2.34×1.6 mm³
- » Viewing Angle = ±22.5 °
- » High reliability
- » Good spectral matching to Si photo detector
- » RoHS compliance

APPLICATIONS

- » Infrared sensor
- » Infrared Touch Panel applications

ABSOLUTE MAXIMUM RATINGS

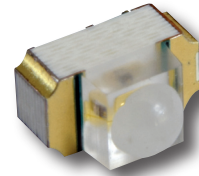
PARAMETER	RATING
Continuous forward current I_F [mA]	70
Peak forward current I_{FP} [A] (pulse≤100μs, duty≤1%)	1
Reverse voltage V_R [V]	5
Operating temperature T_{OPR} [°C]	-40 ... +85
Storage temperature T_{STG} [°C]	-40 ... +100
Thermal resistance (junction-ambient) $R_{th(j-a)}$ [°C/W]	540
Power dissipation P_D [mW]	120

ELECTRO-OPTICAL SPECIFICATIONS

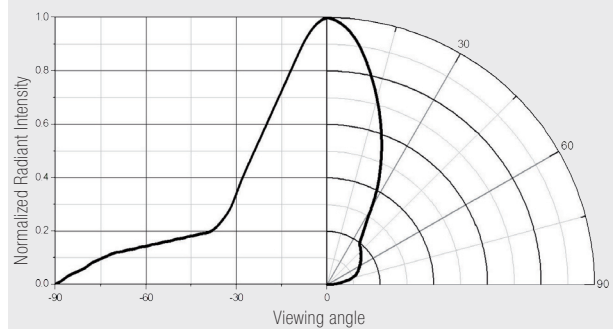
PARAMETER	RATING		
	min.	typ.	max.
Radiant intensity @ $I_F=20mA$ I_θ [mW/sr]	3.5	4.65	6.5
Radiant intensity @ $I_F=70mA$ I_θ [mW/sr]	-	16.0	-
Peak wavelength @ $I_F=20mA$ I_p [nm]	-	940	-
Spectral bandwidth @ $I_F=20mA$ DI [nm]	-	30	-
Angle of half intensity @ $I_F=20mA$ $\alpha_{1/2}$ [deg]	-	-	-
Forward voltage @ $I_F=20mA$ V_F [V]	1.0	1.25	1.5
Forward voltage @ $I_F=70mA$ V_F [V]	1.1	1.38	1.7
Reverse current @ $V_R=5V$ I_R [μA]	-	-	10

Ie BIN RANK

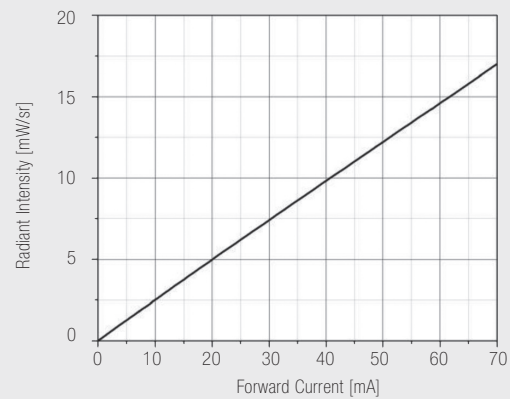
Bin Code	Fa	Ga
Min.	3.5	4.5
Max.	4.5	6.5



ANGULAR DISPLACEMENT



RADIANT INTENSITY VS. FORWARD CURRENT



FORWARD CURRENT VS. AMBIENT TEMPERATURE

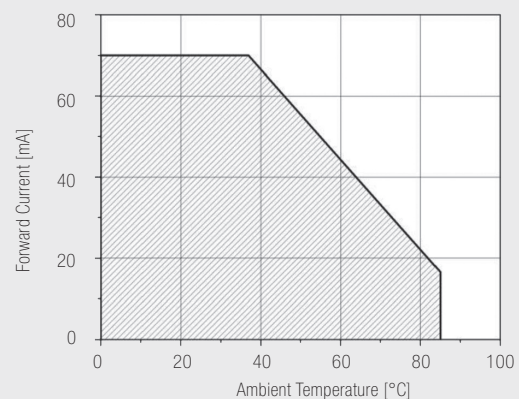
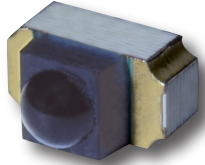
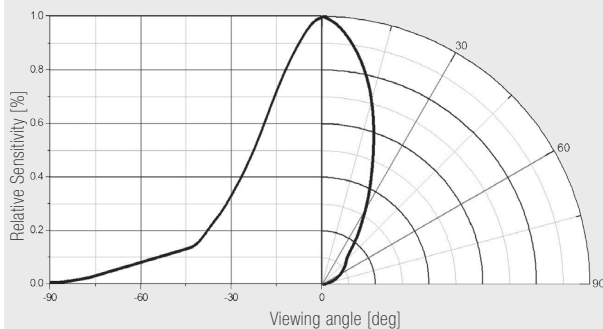


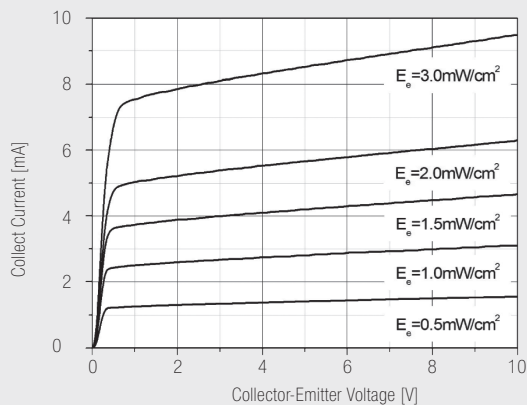
PHOTO TRANSISTOR PTP83016BT24 – SIDE VIEW PACKAGE



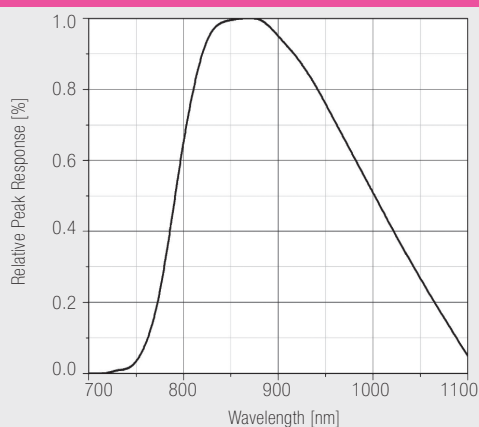
ANGULAR DISPLACEMENT



COLLECT CURRENT VS. COLLECTOR-EMITTER VOLTAGE



PEAK RESPONSE VS. WAVELENGTH



The **PTP83016BT24** is a silicon NPN phototransistor in SMD package. The device comes with a superior filtering for visible light by utilizing special black molding compound.

FEATURES

- » Small side view package 3.0×2.34×1.6 mm³
- » High photo sensitivity
- » High reliability
- » Spectral range of sensitivity; 760 nm ... 1100 nm
- » Fast response time
- » RoHS compliance

ANWENDUNGEN

Infrared sensor and Infrared Touch Panel applications

ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING
Collector current I_C [mA]	20
Collector-Emitter Voltage $B_{V_{CE0}}$ [V]*	35
Emitter-Collector Voltage $B_{V_{CE0}}$ [V]**	5
Operating temperature T_{OPR} [°C]	-40 ... +85
Storage temperature T_{STG} [°C]	-40 ... +100

ELECTRO-OPTICAL SPECIFICATIONS

PARAMETER	RATING	min. typ. max.		
		min.	typ.	max.
Spectral bandwidth I [nm]		760	-	1100
Peak sensitivity I_p [nm]		-	880	-
Angle of half intensity @ $V_{CE}=5V$ $\alpha_{1/2}$ [deg]		-	±22.5	-
Dark current I_{CEO} [nA] @ $E_e=0$ mW/cm ² , $V_{CE}=20V$		-	-	100
Coll.-Emitt. saturation voltage $V_{CE(sat)}$ [V] $E_e=1$ mW/cm ² , $I_C=1.4$ mA		-	-	0.4
Collector light current I_C [mA] @ $E_e=1$ mW/cm ² , $V_{CE}=5V$, $I_p=940$ nm		1.4	2.8	4.4
Terminal capacitance C_T [pF] @ $E_e=0$ mW, $V_{CE}=5V$, $f=1$ MHz		-	3.80	-
Rise time t_r [μs]		-	6	-
Fall time t_f [μs]		-	7	-
Turn on delay time t_{on} [μs]		-	11	-
Turn off delay time t_{off} [μs] @ $V_{CE}=5V$, $R_L=100\Omega$, $I_C=1$ mA		-	7.9	-

IC BIN RANK (Tolerance of Collector Light Current: ±10%)

Bin Code	Ta	Tb
Min.	1.4	2.4
Max.	2.4	4.4

LOW-, MID- AND HIGH-POWER LED SERIES



MAIN FEATURES

- » Compact package types
- » Color temperatures from 2700 K to 6500 K
- » Wattages from 0.2 to 1W
- » Luminous flux up to 113lm
- » Excellent thermal management
- » Very low thermal resistances
- » Maximum junction temperature up to 125°C
- » Excellent cost efficiency

APPLICATIONS

- » LED light tubes (T5&T8)
- » Light panels
- » Home lighting
- » Decorative and entertainment lighting
- » Indirect lighting
- » General lighting
- » Backlighting
- » Retrofits

MAXIMUM RELIABILITY

For all series LM80 and TM21 Reports files are available. Allow the developer to estimate the light falloff curve and thus the lifetime of the light source under real operating conditions.

EVERLIGHT Electronics Co., Ltd. was founded in

1983 in Taipei, Taiwan. The company has rapidly become a leading worldwide LED supplier due to its dedication to certification, R&D, production, quality, marketing and global customer service.

Everlight provides a comprehensive optoelectronics product portfolio consisting of high power LEDs, lamps, SMD LEDs, LED lighting modules, digital displays, optocouplers and infrared components for various applications. EVERLIGHT is a global company with over 5,600 employees based in China, Hong Kong, Japan, Korea, Singapore, Malaysia, India, Germany, Sweden, U.S., and Canada.

OPTIMUM QUALITY IF LIGHT

Almost all series are available at color temperature binning Mac Adam Step 7 (six CCT bins) as well as at narrower binning Mac Adam Step 3 (center-Bin).

Thus color temperature differences within the light source as well as between neighbored light sources are avoided efficiently.

At the same time the goods logistics and assembly by pick & place machines are considerably simplified.

In addition, the series XI3030 and 62-217D addition to the standard color rendering index of min. 80 also available with CRI 90 min.

INNOVATIVE PACKAGING TECHNOLOGY WITH POWERFUL LED CHIPS

The highly efficient LEDs Series 45-21S, 67-21S, 62-217D and XI3030 Everlight feature an advanced thermal management and the latest LED chip technology.

Thus the integrated heat slug ensures that the power loss is dissipated directly to the heat sink without detour. This results in an extremely low thermal resistance of 20 K/W to 50 K/W (depending on package type), which enables the integration of much more powerful LED chips and thus up to three times higher luminous flux compared to established package types. In conservative operation at reduced operating current, however, the junction temperature is lowered, which is associated with a significantly higher life and maximum overall efficiency of the light source.



LOW-, MID- AND HIGH-POWER LED SERIES

	SERIES	CCT	CCT-BINNING MacAdam Step 3	CCT-BINNING MacAdam Step 7	LUMINOUS FLUX [lm]	Ra80 (MIN.)	Ra90 (MIN.)	FORWARD CURRENT [mA]	FORWARD VOLTAGE [V]	BENEFITS/APPLICATIONS
High Power LED	XI3030(2S)/EU Package 3030  1 W / 120° 3,0×3,0×0,8 mm³	2700 K ... 6500 K ANSI	•	•	101 ... 113	•	2700 K	150	5,8 ... 7,0	Benefits: Cost-effective replacement of high-power LEDs based on ceramic substrate Lower costs due to reduced number of LEDs per luminaire compared to 0.5 W LED Epoxy housing for extreme durability Low thermal resistance of 15 K/W CRI90 version Applications: Indirect lighting Light panels, Down lights Decorative lamps
	62-217D/EU Package 5630  0.5 W / 120° 5,6×3,0×0,65 mm³	2700 K ... 6500 K ANSI	•	•	40 ... 70	•	2700 K 3000 K 4000 K	150	2,8 ... 3,5	Benefits: High production capacity of 400 million pcs. per month Reliable delivery times Excellent price/performance ratio CRI90 versions available Applications: LED light panels LED light tubes (T5 & T8) LED light stripes, LED backlight
Mid Power/Low Power LED	45-21S/EU Package 3020S  0.2 W / 120° 3,0×2,0×0,8 mm³	2700 K ... 6500 K ANSI	•	•	16 ... 24	•		60	2,9 ... 3,6	Benefits: Uniform light distribution and avoidance of optical hot spots due to moderate light output Highest efficiency of the light source at conservative operating below nominal current Applications: LED light tubes (T5 & T8) LED light stripes, LED backlight Status indicators Switch lighting
	67-21S/EU Package 2835  0.2 W/0.06 W / 120° 2,8×3,5×0,7 mm³	2700 K ... 6500 K ANSI	•	•	17 ... 27	•		60	2,9 ... 3,6	Benefits: such as series 45-21S/EU Applications: such as series 45-21S/EU 20 mA version as a highly efficient replacement for package 3528
			•	•	7 ... 11	•		20	2,8 ... 3,5	

PAN1740 – „nanopower“ BLUETOOTH® SMART MODULE



PAN1740 is the next generation Bluetooth Low Energy Module from Panasonic with reduced form factor, significantly lower power consumption and embedded Software Stack.

The “nanopower” Low Energy Device is a Single Mode Bluetooth Smart System-on-Chip module optimized for low power, small size and low system cost products. It reduces external component count, development effort and time to market.

The module is manufactured in a very small 9.0 mm×9.5 mm×1.8 mm SMD package with shielded case and chip antenna. The power consumption of only 4.9 mA in Tx and Rx mode makes the use of coin cell batteries possible and decreases the needed battery requirements up to 50% compared to current generation BLE devices. It is qualified according to Bluetooth 4.1 standard. FCC, IC and CE approvals are under preparation.

The PAN1740 comes with a complete software development platform, which includes a qualified Bluetooth Smart single-mode stack on chip. Multiple Bluetooth Smart profiles for consumer wellness, sport, fitness, security and proximity applications are supplied as standard, while additional customer profiles can be developed and added as needed. Interfaces are GPIO, UART, SPI, I²C, 3-axis QD, ADC.

OTP (One Time Programmable)

Memory on board: 42k SRAM, 32k OTP memory for Profiles and Apps (delivered blank), 84k ROM for LE Host and Boot ROM. The PAN1740 is programmed on the customer’s production line. Apps and Profiles are copied from OTP, during start up, and executed in SRAM.

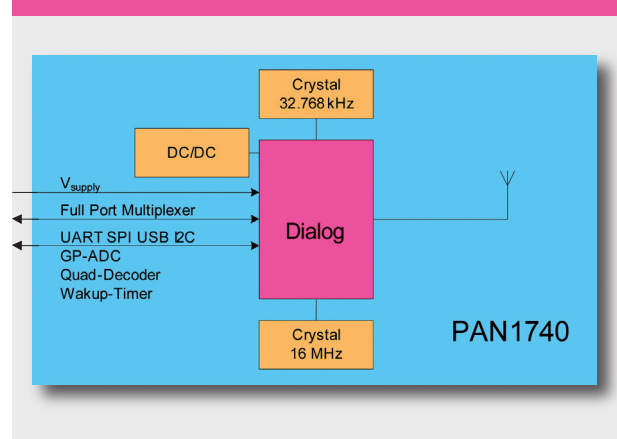
APPLICATIONS

- » Portable devices
- » Health care, medical diagnostic systems
- » Sports and leisure equipment
- » Mobile phone accessories
- » Industrial measurement and diagnosis
- » Devices with critical power consumption

TECHNICAL DATA

PARAMETER	VALUE	CONDITION/REMARK
Receiver sensitivity (1% PER)	-93 dBm	BER 1%
Output power	0 dBm	Maximum setting
Power supply	2.35 V ... 3.3V	Single operation voltage
Current consumption Transmit mode	4.9 mA	GFSK
Current consumption Receive mode	4.9 mA	GFSK
Operating temperature range	-40 ... +85	Industrial range

BLOCK DIAGRAM



LOW ESR TUNING FORK SERIES CM315DL



Ceramic housing
RoHS compliant

Due to the ongoing miniaturization of electronic devices, manufacturers of passive and active components strive to reduce their component sizes. This also applies to clock crystals which are widely used in application as home automation, metering or mobile phone which requiring a precise timing frequency. The time reference is often provided by tuning fork quartzes. From the frequency of 32.768 kHz, the second pulse can be generated by dividing the frequency.

The effect of the miniaturization of conventional quartz is often underestimated, because a reduction of the inner quartz disc usually causes an increase in the ESR value (Equivalent Series Resistance). But precisely this resistance should be as low as

possible in order to ensure a high "Q"-value and reliable starting of oscillation. In addition, the applied power and thus the power consumption with higher ESR increases, because in order to keep the quartz in a stable oscillation, it is necessary to permanently supply the crystal with energy and the higher ESR causes bigger losses.

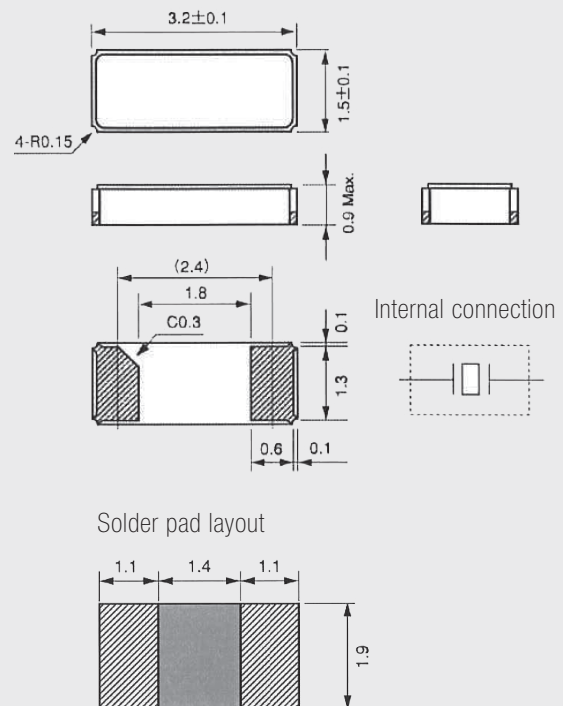
With the series CM315DL Citizen Finetech Miyota succeeds, despite miniaturization to reduce the ESR to a maximum of 50 kΩ. This represents an improvement of approximately 30% based on the usual ESR of 70 kΩ at the tuning fork design 3.2 mm×1.5 mm. This tuning fork is therefore perfectly suited in application using battery power supply as „low power micro computer“ applications. Citizen Finetech Miyota announced the start of production for October 2014.

Samples are available on request. The crystals are manufactured with most common load capacitance of 12.5 pF, but 9.0 pF, 7.0 pF and 6.0 pF are also realizable.

STANDARD SPECIFICATIONS

PARAMETER	CM315DL
Nominal frequency f_0	32.768 kHz
Frequency tolerance Df/f_0 (at 25°C)	±20 ppm
Load capacity C_L (specified by customer)	9.0 pF, 12.5 pF
Operating temperature T_{OPR}	-40°C ... +85°C
Storage temperature T_{STG}	-55°C ... +125°C
Turnover temperature T_M	25°C±5°C
Temperature coefficient b	-0.034± 0.006 ppm/°C ²
ESR R_1 (at 25°C)	50 kΩ max.
Level of drive D_L	0.5 μW max.
Aging (first year) Df/f_0 (at 25°C±3°C)	±3ppm max.
Shunt capacity C_0	1.30pF typ.

DIMENSIONS (mm)



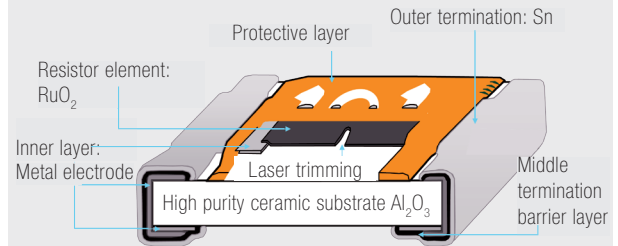
HIGH-VOLTAGE RESISTORS WITH UL CERTIFICATION – FVS SERIES



UL
UL Certified No. E358325

The **FVS-Serie** of the manufacturer PDC is classified according to the safety standards „UL/IEC 60950 2,5 kV pulses“ and „UL/IEC 60065 10 kV pulses“. The particular material which is used to achieve the high dielectric strength, has a typical VCR value of ± 300 ppm/V. The FVS series is listed under File No. E358325 UL. It is suitable for applications in all industrial and automotive and medical fields, where high safety standards are imposed in terms of dielectric strength.

CONSTRUCTION OF FVS SERIES



SPECIFICATIONS

	TYPE	SMD SIZE [INCH]	POWER @70°C	MAX. WORKING VOLT.	MAX. OVERVOLTAGE	RESIS. TOLERANCE	TEMP. COEFF. [ppm/°C]	RESISTANCE RANGE	RESISTANCE SERIES
FVS03	0603	1/10W	200V	400V	$\pm 1\%$ (F) $\pm 5\%$ (J)	± 100 ± 200	100 k Ω ...10M Ω 100 k Ω ...22M Ω	E96/E24 E24	
FVS05	0805	1/8W	400V	800V	$\pm 1\%$ (F) $\pm 5\%$ (J)	± 100 ± 200	100 k Ω ...10M Ω 100 k Ω ...22M Ω	E96/E24 E24	
FVS06	1206	1/4W	800V	1600V	$\pm 1\%$ (F) $\pm 1\%$ (F) $\pm 5\%$ (J)	± 100 ± 200 ± 200	100 k Ω ...10M Ω 11 M Ω ...22M Ω 100 k Ω ...100M Ω	E96/E24 E24 E24	
FVS20	2010	1/2W	2000V	3000V	$\pm 1\%$ (F) $\pm 1\%$ (F) $\pm 5\%$ (J)	± 100 ± 200 ± 200	100 k Ω ...10M Ω 11 M Ω ...22M Ω 100 k Ω ...100M Ω	E96/E24 E24 E24	
FVS25	2512	1W	3000V	4000V	$\pm 1\%$ (F) $\pm 1\%$ (F) $\pm 5\%$ (J)	± 100 ± 200 ± 200	100 k Ω ...10M Ω 11 M Ω ...22M Ω 100 k Ω ...100M Ω	E96/E24 E24 E24	

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