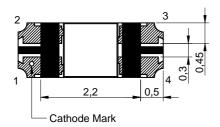
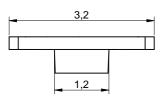
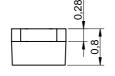
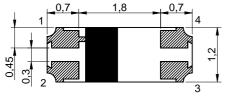
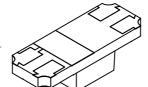
# **Dimensions: [mm]**





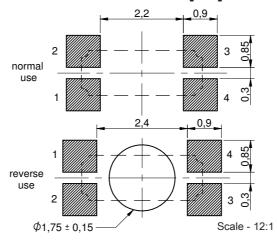




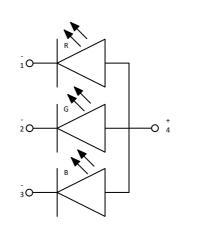


Scale - 12:1

# **Recommended Land Pattern: [mm]**



## **Schematic:**



# **Absolute Maximum Ratings (Ambient Temperature 25°C):**

	• •	•	,	
Properties		Test conditions	Value	Unit
Power Dissipation (Red)	P <sub>Diss R</sub>		48	mW
Power Dissipation (Green)	P <sub>Diss G</sub>		78	mW
Power Dissipation (Blue)	P <sub>Diss B</sub>		78	mW
Peak Forward Current	I <sub>F Peak</sub>	duty/ 10 @ 1 kHz	40	mA
Continuous Forward Current	I <sub>F</sub>		20	mA
Reverse Voltage	V <sub>REV</sub>		5	V
ESD Threshold/ Human Body Model	V <sub>ESD HBM</sub>		1000	V

# **Optical Properties:**

Chip Technology	AllnGaP + InGaN				
Emitting Color	Red & Green & Blue				
Lens Type	Rectangular				

# **General Information:**

Operating Temperature	-40 up to +85 °C
Storage Conditions (in original packaging)	< 40 °C;< 90 % RH
Storage Conditions (for single parts)	-40 up to +85 °C
Moisture Sensitivity Level (MSL)	3

Würth Elektronik eiSos GmbH & Co. KG



EMC & Inductive Solutions Max-Eyth-Str. 1 74638 Waldenburg

Germany Tel. +49 (0) 79 42 945 - 0 www.we-online.com

DATE (YYYY-MM-DD) GENERAL TOLERANCE PLD 001.001 2019-01-25 DIN ISO 2768-1m

**WL-SFRW SMT Full-color Reverse** mount Waterclear 156125M173000 SIZE/TYPE BUSINESS UNIT 1205 eiPal Valid

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where a failure of the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik elSos GmbH & Co KG must be informed about the intent of such usage before the design-in stage. In addition, sufficient reliability, evaluation checks for safety must be performed on every electronic component which is used in electrical circuits that require high safety and reliability are product in the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik elSos GmbH & Co KG must be informed about the intent of such usage before the design-in stage. In addition, sufficient reliability evaluation checks for safety must be performed on every electronic component within its used in electrical circuits that require high safety and reliability to a control, train control train control train control.

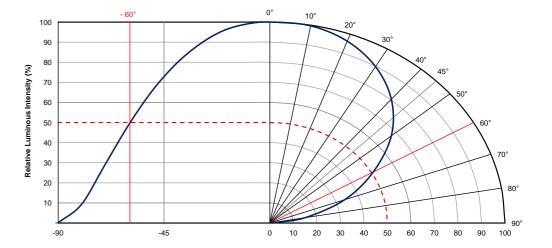
# **Electrical & Optical Properties:**

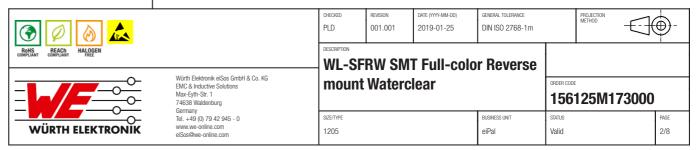
Dranartia		Test conditions	Value							
Properties		lest conditions	min.	typ.	max.	Unit				
Peak Wavelength (Red)	λ <sub>Peak R</sub>	20 mA		632		nm				
Peak Wavelength (Green)	λ <sub>Peak G</sub>	20 mA		520		nm				
Peak Wavelength (Blue)	λ <sub>Peak B</sub>	20 mA		468		nm				
Dominant Wavelength (Red)	λ <sub>Dom R</sub>	20 mA		624		nm				
Dominant Wavelength (Green)	λ <sub>Dom G</sub>	20 mA		525		nm				
Dominant Wavelength (Blue)	λ <sub>Dom B</sub>	20 mA		470		nm				
Luminous Intensity (Red)	I <sub>V R</sub>	20 mA	28	80		mcd				
Luminous Intensity (Green)	I <sub>V G</sub>	20 mA	112	280		mcd				
Luminous Intensity (Blue)	I <sub>V B</sub>	20 mA	28	70		mcd				
Forward Voltage (Red)	V <sub>FR</sub>	20 mA		2	2.4	V				
Forward Voltage (Green)	V <sub>F G</sub>	20 mA		3.3	3.9	V				
Forward Voltage (Blue)	V <sub>FB</sub>	20 mA		3.3	3.9	٧				
Spectral Bandwidth (Red)	Δλ R	20 mA		20		nm				
Spectral Bandwidth (Green)	Δλ G	20 mA		30		nm				
Spectral Bandwidth (Blue)	Δλ Β	20 mA		20		nm				
Reverse Current	I <sub>REV</sub>	5 V			100	μА				
Viewing Angle Phi 0°	2θ <sub>50%</sub>	20 mA		120		0				

# **Certification:**

RoHS Approval	Compliant [ 2011/65/EU&2015/863 ]
REACh Approval	Conform or declared [ (EC)1907/2006 ]
Halogen Free	Conform [ IEC 61249-2-21 ]
Halogen Free	Conform [ JEDEC JS709B ]

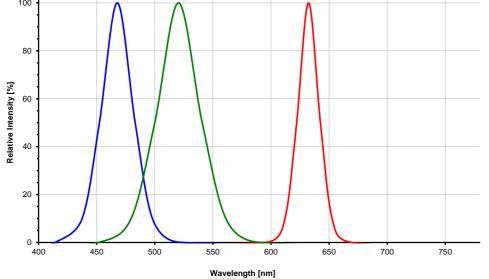
# **Viewing Angle:**



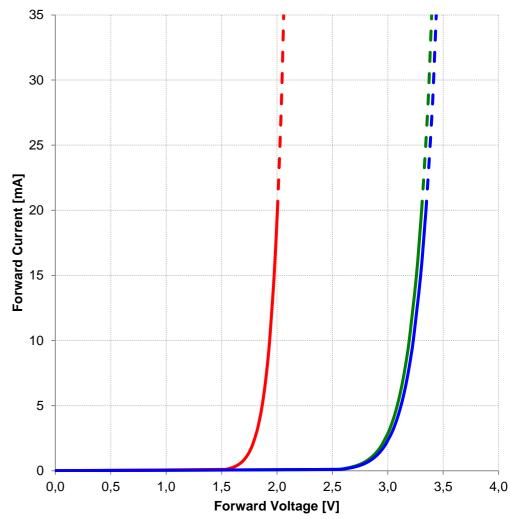


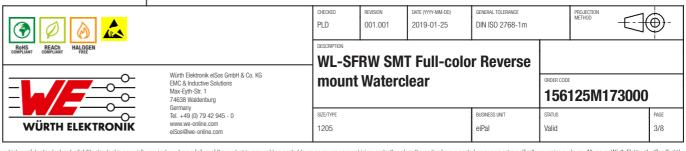
This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment only. This product is not authorized for use in equipment only. This product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eißos GmbH & Co KG must be informed do for use in areas such as millitary, aerospace, aviation, nuclear control, ship control), train control, ship control), train control, bright control is great and eliability evaluation checks for safety must be performed on every electronic component which is used in that require light is after a train eliability evaluation checks for safety must be performed on every electronic component which is used in that require light is after a prevention.

# Spectral:

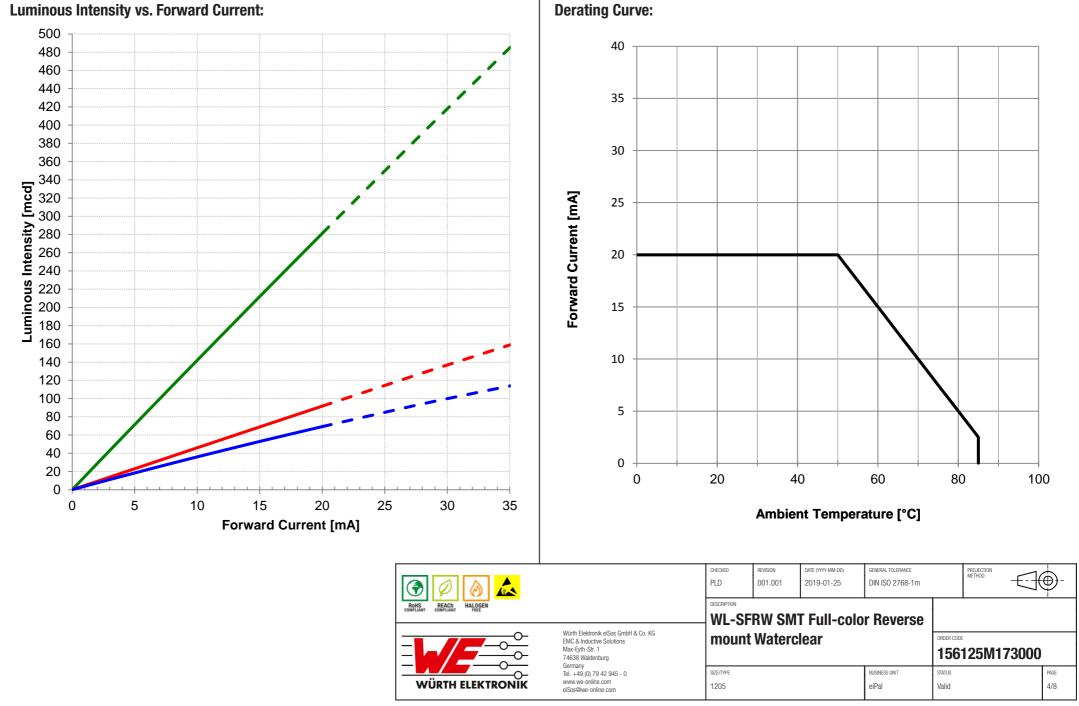


# Forward Current vs. Forward Voltage:



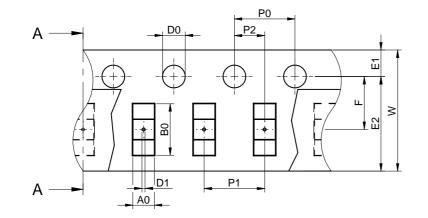


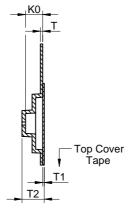
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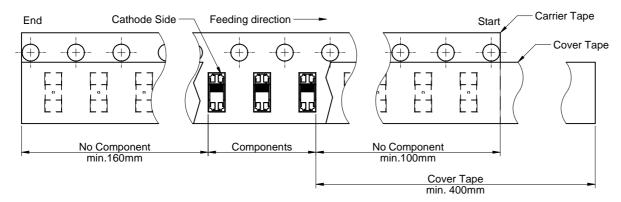


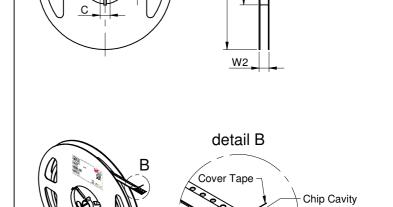
This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where a failure of the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik elSos GmbH & Co Kg must be informed about the intent of such usage before the design-in stage. In addition, sufficient reliability, evaluation checks for safety must be performed on every electronic component which is used in electrical circuits that require high safety and reliability realuration or performance.

# Packaging Specification - Tape and Reel: [mm]









W3.

Z

W1 close to center

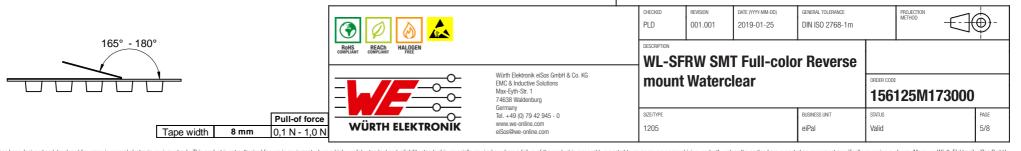
Sprocket Hole

		Α	В	С	D	N	W1	W2	W3	W3
Tolerance		± 2,0	min.	min.	min.	min.	+1,5	max.	min.	max.
Tape width	8 mm	178	1.5	12.8	20.2	50	8.4	14.4	7.9	10.9

Embossment

packaging is reffered to the international standard IEC 60286-3:2013

		A0	B0	W	T	T1	T2	K0	P0	P1	P2	D0	D1	E1	E2	F	Tape Type 2a	VPE / packaging unit
tolerance		typ.	typ.	+0,3/ -0,1	ref.	max.	typ.	typ.	±0,1	±0,1	±0,05	+0,1/ -0,0	min.	±0,1	min.	±0,05		pcs.
size	156125M173000	1,42	3,4	8,0	0,23	0,1	1,66	1,37	4,0	4,0	2,0	1,5	0,3	1,75	6,25	3,5	Polystyrene	3000



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# **Classification Reflow Profile for SMT components:**



# **Classification Reflow Soldering Profile:**

Profile Feature		Value
Preheat Temperature Min	T <sub>s min</sub>	150 °C
Preheat Temperature Max	T <sub>s max</sub>	200 °C
Preheat Time $t_s$ from $T_{s min}$ to $T_{s max}$	t <sub>s</sub>	max. 60 - 120 seconds
Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )		3 °C/ second max.
Liquidous Temperature	T <sub>L</sub>	217 °C
Time $t_L$ maintained above $T_L$	t <sub>L</sub>	max. 60 seconds
Peak package body temperature	T <sub>p</sub>	see table
Time within 5°C of actual peak temperaure	t p	max. 10 seconds
Ramp-down Rate (T <sub>L</sub> to T <sub>P</sub> )		6 °C/ second max.
Time 25°C to peak temperature		max. 220 seconds

refer to IPC/ JEDEC J-STD-020E

# **Package Classification Reflow Temperature:**

Properties	Volume mm³ <350	Volume mm <sup>3</sup> 350-2000	Volume mm³ >2000
PB-Free Assembly I Package Thickness < 1.6 mm	260 °C	260 °C	260 °C
PB-Free Assembly I Package Thickness 1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
PB-Free Assembly I Package Thickness ≥ 2.5 mm	250 °C	245 °C	245 °C
Applied cycles	2 cycles max.		

refer to IPC/ JEDEC J-STD-020E

		CHECKED PLD	REVISION 001.001		PROJECTION METHOD	<b>-</b>	
ROHS REACH HALOGEN COMPLIANT COMPLIANT		_	Γ Full-colo				
WÜRTH ELEKTRONIK	Würth Elektronik eiSos GmbH & Co. KG EMC & Inductive Solutions Max-Eyth-Str. 1 74638 Waldenburg Germany	mount	125M173000	)			
	Germany Tel. +49 (0) 79 42 945 - 0 www.we-online.com elSos@we-online.com	SIZE/TYPE 1205			eiPal	status Valid	

## **Cautions and Warnings:**

# The following conditions apply to all goods within the product series of Optoelectronic Components of Würth Elektronik eiSos GmbH & Co. KG:

#### **General:**

- This optoelectronic component is designed and manufactured for use in general electronic equipment.
- Würth Elektronik must be asked for written approval (following the PPAP procedure) before incorporating the components into any
  equipment in fields such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control,
  ship control), transportation signal, disaster prevention, medical, public information network, etc. where higher safety and reliability are
  especially required and/or if there is the possibility of direct damage or human injury.
- Optoelectronic components that will be used in safety-critical or high-reliability applications, should be pre-evaluated by the customer.
- The optoelectronic component is designed and manufactured to be used within the datasheet specified values. If the usage and
  operation conditions specified in the datasheet are not met, the component may be damaged or dissolved.
- Do not drop or impact the components, as the optoelectronic component body may flake apart.
- Würth Elektronik products are qualified according to international standards, which are listed in each product reliability report. Würth
  Elektronik does not warrant any customer qualified product characteristics beyond Würth Elektroniks' specifications, for its validity and
  sustainability over time.
- The responsibility for the applicability of the customer specific products and use in a particular customer design is always within the
  authority of the customer. All technical specifications for standard products also apply to customer specific products.

#### **Product specific:**

#### **Soldering:**

- The solder profile must comply with the Würth Elektronik technical soldering specification. All other profiles will void the warranty.
- · All other soldering methods are at the customers' own risk.

#### **Cleaning and Washing:**

- Washing agents used during the production to clean the customer application might damage or change the characteristics of the
  optoelectronic component body, marking or plating. Washing agents may have a negative effect on the long-term functionality of the
  product
- Using a brush during the cleaning process may break the optoelectronic component body. Therefore, we do not recommend using a
  brush during the PCB cleaning process.

#### Potting:

If the product is potted in the customer application, the potting material may shrink or expand during and after hardening. Shrinking
could lead to an incomplete seal, allowing contaminants into the optoelectronic component body, pins or termination. Expansion could
damage the optoelectronic component body, pins or termination. We recommend a manual inspection after potting to avoid these
effects.

#### **Storage Conditions:**

- A storage of Würth Elektronik products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. Therefore, all products shall be used within the period of 12 months based on the day of shimment
- Do not expose the optoelectronic component to direct sunlight.
- The storage conditions in the original packaging are defined according to DIN EN 61760-2.
- For a moisture sensitive component, the storage condition in the original packaging is defined according to IPC/JEDEC-J-STD-033. It is
  also recommended to return the optoelectronic component to the original moisture proof bag and reseal the moisture proof bag again.

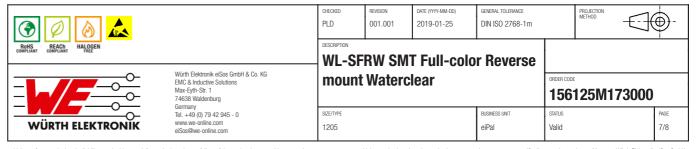
#### **Handling:**

- · Violation of the technical product specifications such as exceeding the nominal rated current, will void the warranty.
- The product design may influence the automatic optical inspection.
- Certain optoelectronic component surfaces consist of soft material. Pressure on the top surface has to be handled carefully to prevent negative influence to the function and reliability of the optoelectronic components.
- ESD prevention methods need to be applied for manual handling and processing by machinery.
- Resistors for protection are obligatory.
- Luminaires in operation may harm human vision or skin on a photo-biological level. Therefore direct light impact shall be avoided. All
  products are additionally certified as risk groups 0 to 2 according to DIN EN 62471:2008.
- In addition to optoelectronic components testing, products incorporating these devices have to comply with the safety precautions given
  in IEC 60825-1 and IEC 62471.

#### **Technical specification:**

- The typical and/or calculated values of technical parameters can only reflect statistical figures. The actual parameters of each single product, may differ from the typical and/or calculated values or the typical characteristic line.
- On each reel, only one bin is sorted and taped. The bin is defined on intensity, chromaticity coordinate or wavelength and forward voltage.
- In order to ensure highest availability, the reel binning of standard deliveries can vary. A single bin cannot be ordered. Please contact us
  in advance, if you need a particular bin sorting before placing your order to clarify the lead time, MOQ and pricing.

These cautions and warnings comply with the state of the scientific and technical knowledge and are believed to be accurate and reliable. However, no responsibility is assumed for inaccuracies or incompleteness.



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## **Important Notes**

# The following conditions apply to all goods within the product range of Würth Elektronik eiSos GmbH & Co. KG:

#### 1. General Customer Responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact it is up to the customer to evaluate, where appropriate to investigate and decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not.

#### 2. Customer Responsibility related to Specific, in particular Safety-Relevant Applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. In certain customer applications requiring a very high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component. Therefore, customer is cautioned to verify that data sheets are current before placing orders. The current data sheets can be downloaded at www.we-online.com.

#### 3. Best Care and Attention

Any product-specific notes, cautions and warnings must be strictly observed. Any disregard will result in the loss of warranty.

#### 4. Customer Support for Product Specifications

Some products within the product range may contain substances which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case the field sales engineer or the internal sales person in charge should be contacted who will be happy to support in this matter.

#### 5. Product R&D

Due to constant product improvement product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard inform about minor and major changes. In case of further queries regarding the PCN, the field sales engineer or the internal sales person in charge should be contacted. The basic responsibility of the customer as per Section 1 and 2 remains unaffected.

#### 6. Product Life Cycle

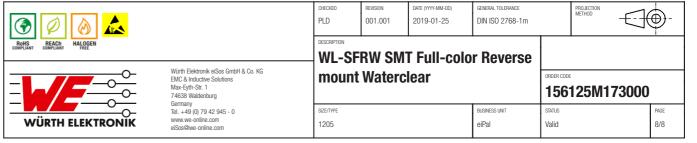
Due to technical progress and economical evaluation we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available. Therefore it needs to be verified with the field sales engineer or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

#### 7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

#### 8. General Terms and Conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at www.we-online.com.



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# **X-ON Electronics**

Largest Supplier of Electrical and Electronic Components

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EASV1803BA0 LG M67K-H1J2-24-0-2-R18-Z LS A676-P2S1-1 SML310BATT86 SML-512VWT86A SML-LX0606SISUGC/A SML-LXL1307SRC-TR SML-LXR851SIUPGUBC LT1ED53A FAT801-S AM27ZGC03 APB3025SGNC APFA3010SURKCGKQBDC

APHK1608VGCA APT2012QGW CLX6D-FKB-CN1R1H1BB7D3D3 LTST-C250KGKT LTW-020ZDCG LTW-21TS5 LTW-220DS5

JANTXM19500/521-02 UYGT801-S LO T67F-V1AB-24-1 YGFR411-H 598-8330-117F SML-LX0402IC-TR CMDA20AYAA7D1S

CMDA16AYDR7A1X 339-1SURSYGW/S530-A2 598-8040-100F 598-8070-100F 598-8140-100F 598-8610-200F EAPL3527GA5 67
11/BHC-M1N2B8Y/2A0 SML-LXL1209SYC/ATR EASV3020YGA0