

FEW SERIES

20~30W WIDE INPUT RANGE

DANUBE

FEATURES

- 20~30W DIL PACKAGE
- INDUSTRY STANDARD PACKAGE
- 9-18V,18-36V,36-75V,9-36V,18-75V WIDE INPUT RANGE
- REGULATED OUTPUT
- INPUT UVLO & OVLO
- HIGH EFFICIENCY
- UL 94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- 3 YEARS WARRANTY



OUTPUT SPECIFICATIONS		INPUT SPECIFICATIONS	
Voltage Set-point Accuracy	+/-2% max.	Input Voltage Range	2:1 or 4:1 Input Range
Temperature Coefficient	+/-0.05%/°C	Input Filter	Pi Network
Ripple & Noise(20MHz BW) ¹	150mVp-p max.	Protection	Fuse Recommended
Line Regulation ²	+/-0.3% max.	OVLO(Over Voltage Lockout)	See Page 6
Load Regulation ³	+/-0.5% max.	UVLO(Under Voltage Lockout)	See Page 6
Minimum Load ⁴	10% of Full Load	OVLO & UVLO Circuit Restart	Automatic
Short Circuit Protection	Continuous	GENERAL SPECIFICATIONS	
Short Circuit Restart	Automatic	Efficiency	88% typ.
Over Load Protection	130%~180%	Isolation Voltage ⁵	1500VDC min.
Transient Response ⁶	500uS max.	Isolation Resistance	10 ⁹ ohms min.
External Trim Adj. Range Vout:5V	+/-10%	Isolation Capacitance	3000pF max.
External Trim Adj. Range Vout:12V,15V	-20%~+10%	Switching Frequency	300 KHz typ.
ENVIRONMENTAL SPECIFICATIONS		MTBF ⁷	>300,000 Hours
Operating Temperature (20W)	-40°C to +75°C	Weight	31.2g typ.
Operating Temperature (30W)	-40°C to +55°C	Case Material	Six-Side Shielded Case
Case Temperature	+105°C max.	Case Size	50.8mm*25.4mm*11.2mm
Storage Temperature	-55°C to +125°C	Radiated Emissions	EN55032 Class A
Humidity	95% max.		
Cooling	Free-Air Convection		

ALL SPECIFICATIONS TYPICAL AT NOMINAL LINE, FULL LOAD, AND 25 °C UNLESS OTHERWISE NOTED.

¹ Measured with 1uF ceramic capacitor connect to the output pins.

² High Line to Low Line.

³ Load Regulation is for output load current change from 10% to 100%.

⁴ FEWS-XXXXA20T Minimum load 20% of full load.

⁵ For 10 seconds.

⁶ 25% Step Load Change.

⁷ MIL-HDBK-217F @25°C, Ground Benign.

● SELECTION GUIDE

2:1 20W OUTPUT

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ⁸ CURRENT(mA)		EFF (%) ⁹	CAPACITOR LOAD (Max)	PACKAGE
				FULL LOAD	NO LOAD			
FEWS-1203.3A20	9-18	3.3	5000	1617	65	85	1000uF	A
FEWS-1205A20	9-18	5	4000	1893	65	88	1000uF	
FEWS-1212A20	9-18	12	1666	1893	20	88	220uF	
FEWS-1215A20	9-18	15	1333	1872	20	89	100uF	
FEWD-1212A20	9-18	+/-12	+/-833	1893	20	88	+/-100uF	
FEWD-1215A20	9-18	+/-15	+/-667	1872	20	89	+/-47uF	
FEWS-2403.3A20	18-36	3.3	5000	809	45	85	1000uF	
FEWS-2405A20	18-36	5	4000	947	45	88	1000uF	
FEWS-2412A20	18-36	12	1666	936	20	89	220uF	
FEWS-2415A20	18-36	15	1333	926	20	90	100uF	
FEWD-2412A20	18-36	+/-12	+/-833	936	20	89	+/-100uF	
FEWD-2415A20	18-36	+/-15	+/-667	926	20	89	+/-47uF	
FEWS-4803.3A20	36-75	3.3	5000	404	40	85	1000uF	
FEWS-4805A20	36-75	5	4000	473	40	88	1000uF	
FEWS-4812A20	36-75	12	1666	473	10	88	220uF	
FEWS-4815A20	36-75	15	1333	468	10	89	100uF	
FEWD-4812A20	36-75	+/-12	+/-833	473	10	88	+/-100uF	
FEWD-4815A20	36-75	+/-15	+/-667	473	10	88	+/-47uF	

Note: Other input to output voltages may be available. Please contact factory.

⁸ NOMINAL INPUT VOLTAGE.

⁹ NOMINAL INPUT VOLTAGE, FULL LOAD.

● **SELECTION GUIDE**
4:1 20W OUTPUT

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ¹⁰ CURRENT (mA)		EFF (%) ¹¹	CAPACITOR LOAD (Max)	PACKAGE
				FULL LOAD	NO LOAD			
FEWS-1203.3A20T	9-36	3.3	5000	1617	80	85	1000uF	A
FEWS-1205A20T	9-36	5	4000	1915	80	87	1000uF	
FEWS-1212A20T	9-36	12	1666	1914	20	87	220uF	
FEWS-1215A20T	9-36	15	1333	1915	20	87	100uF	
FEWS-2403.3A20T	18-75	3.3	5000	808	60	85	1000uF	
FEWS-2405A20T	18-75	5	4000	957	60	87	1000uF	
FEWS-2412A20T	18-75	12	1666	957	20	87	220uF	
FEWS-2415A20T	18-75	15	1333	957	20	87	100uF	

Note: Other input to output voltages may be available. Please contact factory.

¹⁰ NOMINAL INPUT VOLTAGE.

¹¹ NOMINAL INPUT VOLTAGE, FULL LOAD.

● **SELECTION GUIDE**
2:1 30W OUTPUT

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ¹² CURRENT(mA)		EFF (%) ¹³	CAPACITOR LOAD (Max)	PACKAGE
				FULL LOAD	NO LOAD			
FEWS-1203.3B30	9-18	3.3	7000	2292	180	85	1000uF	B
FEWS-1205B30	9-18	5	6000	2841	165	88	1000uF	
FEWS-1212B30	9-18	12	2500	2793	140	89.5	220uF	
FEWS-1215B30	9-18	15	2000	2793	120	89.5	100uF	
FEWS-2403.3B30	18-36	3.3	7000	1119	120	86	1000uF	
FEWS-2405B30	18-36	5	6000	1412	95	88.5	1000uF	
FEWS-2412B30	18-36	12	2500	1404	40	89	220uF	
FEWS-2415B30	18-36	15	2000	1389	40	90	100uF	
FEWS-4803.3B30	36-75	3.3	7000	566	85	85	1000uF	
FEWS-4805B30	36-75	5	6000	710	60	88	1000uF	
FEWS-4812B30	36-75	12	2500	702	55	89	220uF	
FEWS-4815B30	36-75	15	2000	694	30	90	100uF	

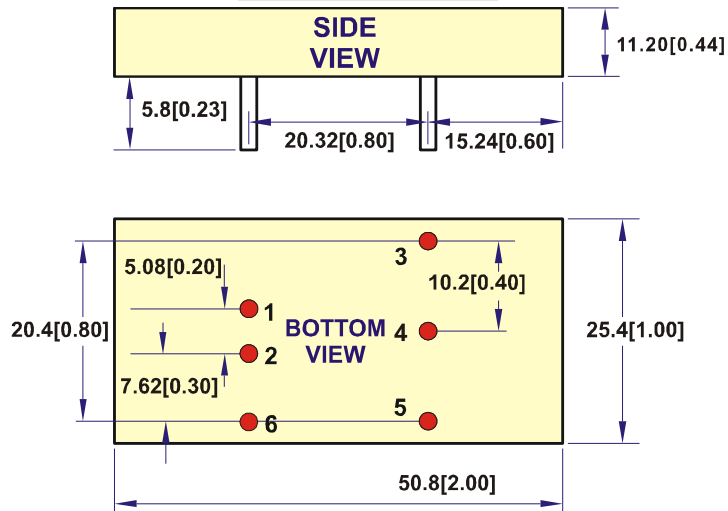
Note: Other input to output voltages may be available. Please contact factory.

¹² NOMINAL INPUT VOLTAGE.

¹³ NOMINAL INPUT VOLTAGE, FULL LOAD.

● MECHANICAL DIMENSIONS

PACKAGE "A"



All dimensions are in millimeters[inches]

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

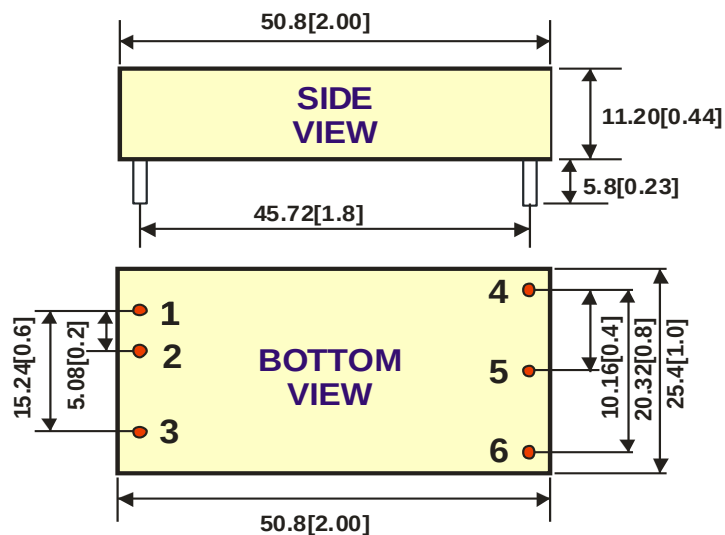
NOTE:

All dimensions are in millimeters [inches]

Pin Size is Tolerance 1.0Φ ±0.10mm

Tolerance .X or .XX= ±0.80mm

PACKAGE "B"



All dimensions are in millimeters [inches]

PIN	SINGLE
1	+Vin
2	-Vin
3	Remote On/Off
4	+Vout
5	-Vout
6	Trim

NOTE:

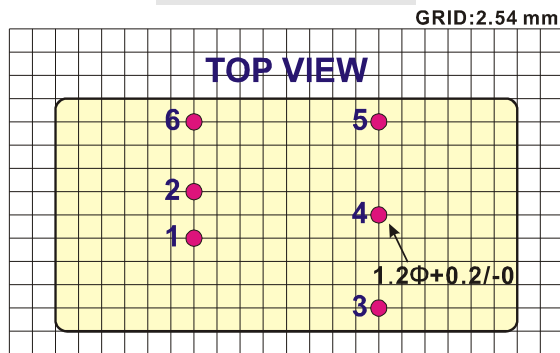
All dimensions are in millimeters [inches]

Pin Size is Tolerance 1.0Φ ±0.10mm

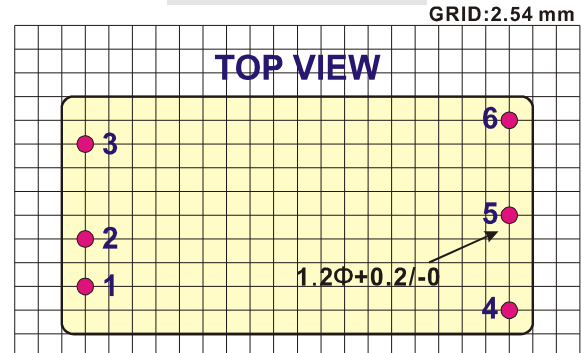
Tolerance .X or .XX= ±0.80mm

● RECOMMENDED FOOTPRINT DETAILS

PACKAGE "A"

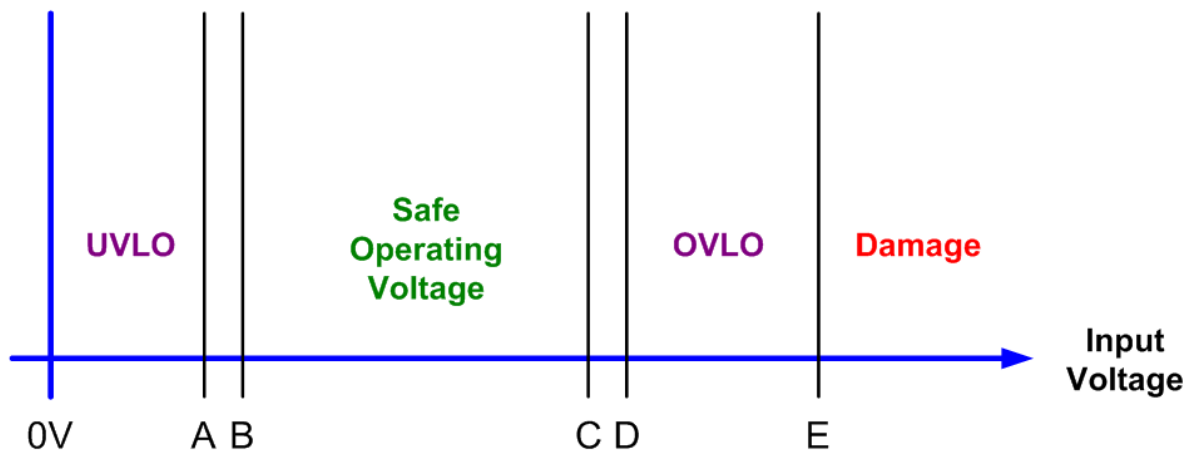


PACKAGE "B"



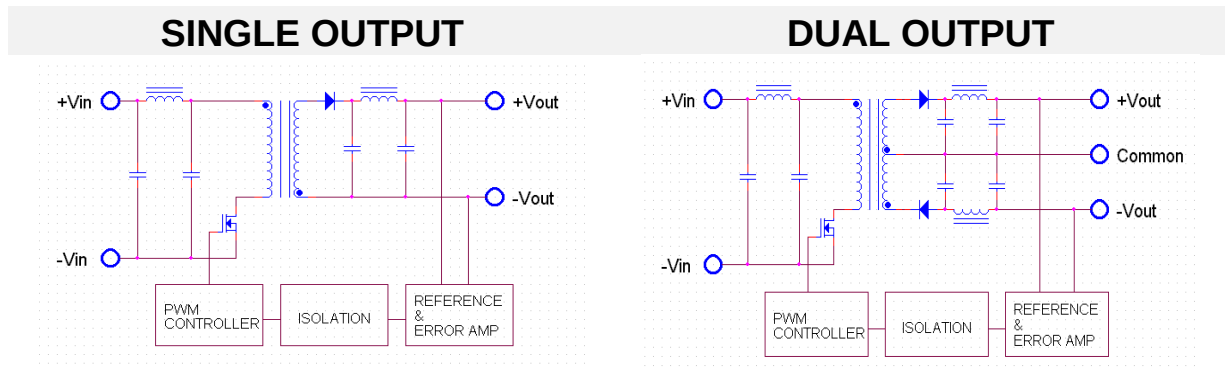
Remote On/Off Control			
Control Input	Package A : PIN6	Package B : PIN3	Control Common PIN2
Control Voltage			Converter Shutdown Idle Current 10mA
ON	>+2.5VDC or Open Circuit		CMOS or Open
OFF	<+0.8VDC or Jumper to PIN2		Logic Compatibility Collector TTL

● INPUT OPERATING VOLTAGE

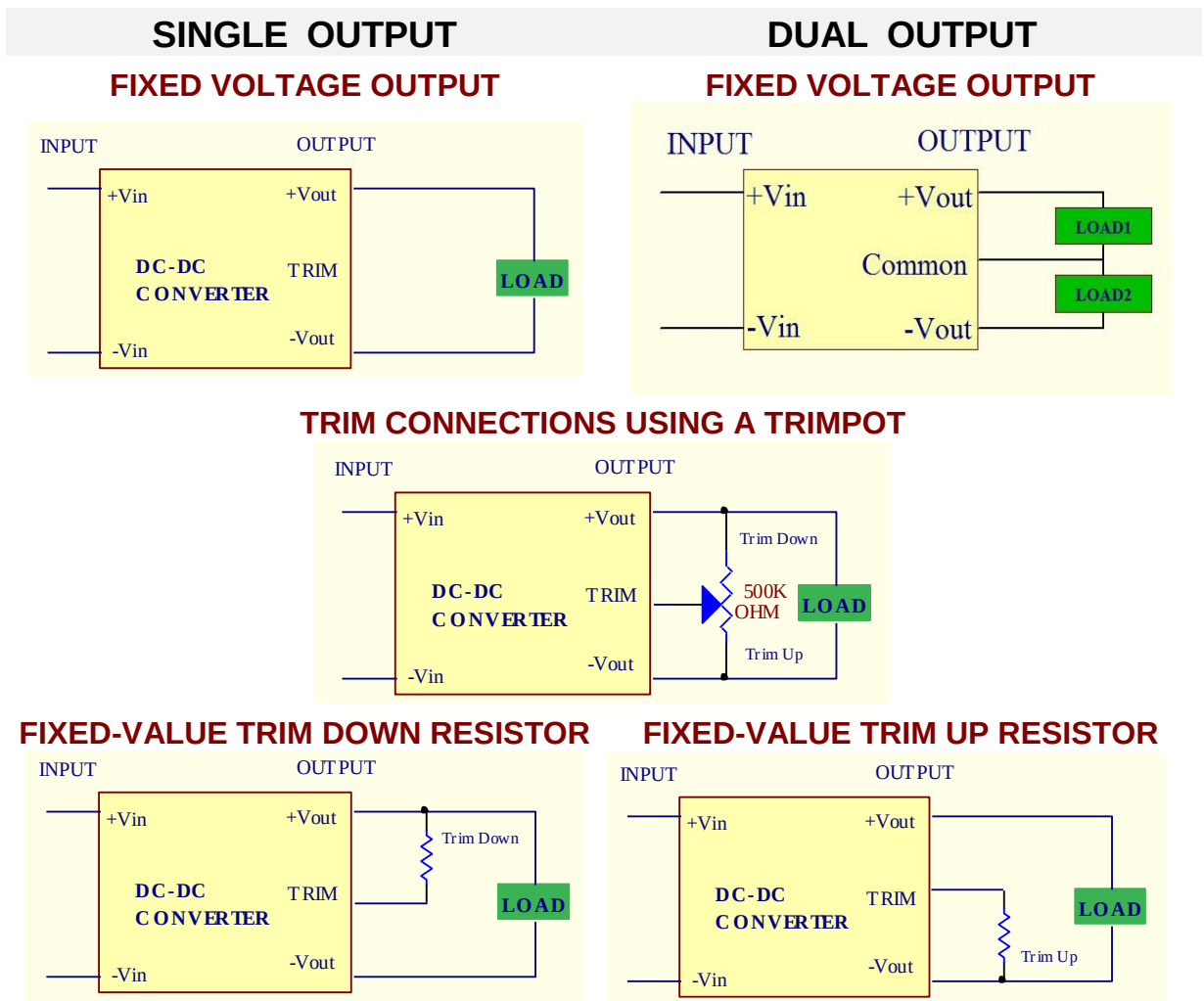


	A	B	C	D	E
FEW*-12*****	8V typ.	9V	18V	20V typ.	25V
FEWS-12*****T	8V typ.	9V	36V	40V typ.	50V
FEW*-24*****	16V typ.	18V	36V	40V typ.	50V
FEWS-24*****T	16V typ.	18V	75V	80V typ.	100V
FEW*-48*****	32V typ.	36V	75V	80V typ.	100V

● SIMPLIFIED SCHEMATIC



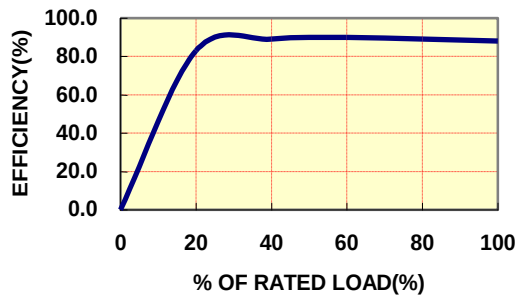
● TYPICAL APPLICATIONS



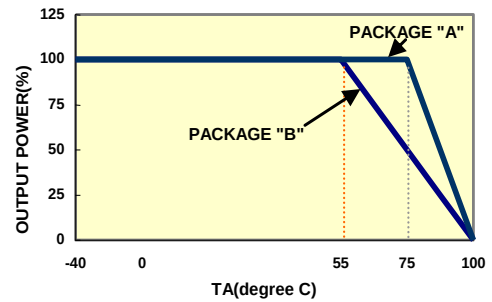
● TYPICAL PERFORMANCE CURVES

Specifications typical at $T_a=25^{\circ}\text{C}$, nominal input voltage, rated output current unless otherwise specified.

OUTPUT LOAD VS EFFICIENCY



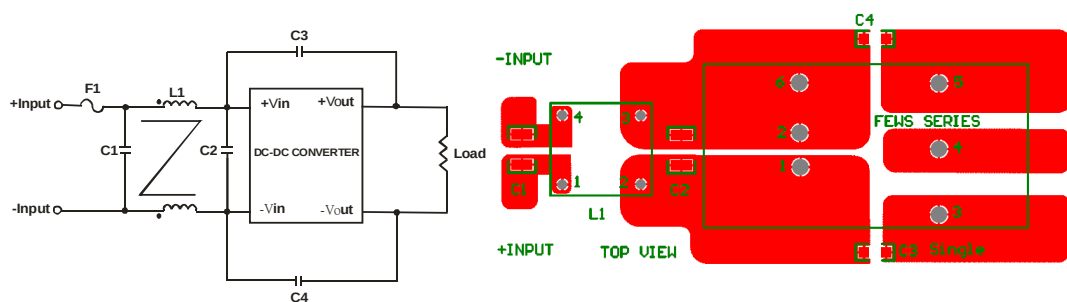
TEMPERATURE DERATING



● RECOMMENDED FILTER FOR EN55032 CLASS B

The components used in the above figure, together with the manufacturer's part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
FEW*-12*****	3.3uF/50V 1812 MLCC	3.3uF/50V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke
FEW*-24*****	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke
FEW*-48*****	1.5uF/100V 1812 MLCC	1.5uF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke



RECOMMENDED EN55032 CLASS B FILTER CIRCUIT LAYOUT

● INPUT FUSE SELECTION GUIDE

9-18V INPUT VOLTAGE(VDC)	18-36V INPUT VOLTAGE(VDC)	36-75V INPUT VOLTAGE(VDC)
5000mA Slow-Blow Type	3000mA Slow-Blow Type	1500mA Slow-Blow Type

Note: Certain applications may require the installation of external fuse in front of the input.

FEW SERIES APPLICATION NOTES:

EXTERNAL CAPACITANCE REQUIREMENTS:

No external capacitance is required for operation of the FEW series.

External output capacitance is not required for operation; however it is recommended that 10uF tantalum and 0.1uF ceramic capacitance be selected for reduced system noise.

We Can Offer EMC-Filter According To EN55032 Class B.

Negative Outputs:

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.

Remote ON/OFF:

The remote ON/OFF pin may be left floating if this function is not use. It is recommended to drive this pin with an open collector arrangement or a relay contact. When the ON/OFF pin is pulled low with respect to the -VIN, the converter is placed in a low power drain state.

Output TRIM:

The TRIM pin may be used to adjust the output +10% ~ -20% from the nominal setting .this function allows adjustment for voltage drops in the system wiring. If the TRIM function is not required the pin may be left floating.

FOR MORE INFORMATION CALL:

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