Low Clamping Chip Micro-Surge Protection Device (CMSL)

CMS3025V681P401-L1FD is a high-performance chip surge protection device designed for application which requiring high input voltage and low clamping voltage protection. As an upgraded alternative to traditional varistors, it retains the core advantages of "small size, high surge current " while significantly reducing the clamping voltage through technological innovation, thereby greatly enhancing overvoltage protection effectiveness.

The product adopts a 3025 chip package suitable for high-density PCB design. It helps customers' devices meet electromagnetic compatibility (EMC) and power safety test standards such as IEC61000-4-5, and is particularly applicable to scenarios with dual requirements for "voltage rating + residual voltage control", such as unstable power grids (e.g., South east Asia), brushless DC motors (BLDC), industrial power supplies, and new energy equipment.

Features

- Upgraded performance, surpassing traditional varistors
- Ultra-low clamping voltage
- Fast response time
- High energy absorption capability
- High reliability & safety
- Flammability: UL94V-0
- SMD type body size 3025
- Suitable for lead-free soldering
- RoHS compliant

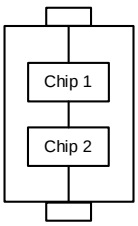


Device Size	Quantity	Reel Size
3025	1500 pcs	15 Inch (380x16.4mm)

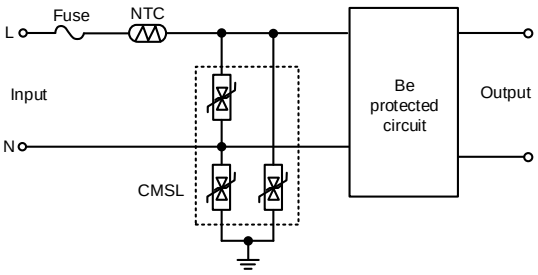
Applications

- LED circuit protection
- Power input protection in regions with unstable power grids (e.g., Southeast Asia)
- Withstand voltage testing and surge protection for brushless DC motors (BLDC)
- Industrial equipment
- New energy
- Consumer electronics

Typical Application Circuit Diagram



CMSL internal structure diagram



Differential and common mode protection

Part Number Code

CMS3025V681P401-L1FD
① ② ③ ④ ⑤

① Product Series

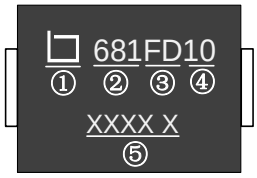
② Package Type
3025: 3025 package

③ Varistor Voltage
681:680V

④ Maximum Peak Pulse Current（1time）
L1: 1000A

⑤ Internal Control Code

Marking

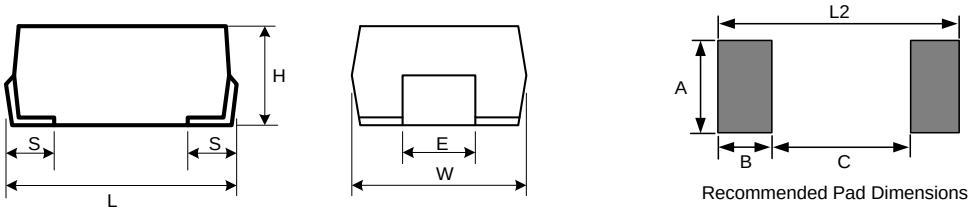


①：Boarden Logo
②：Nominal Varistor Voltage，681: 680V
④：Maximum Peak Pulse Current (1 time), 10: 1000A
③ ⑤：Internal Control Code

Device Ratings and Specifications (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Value	Unit
Nominal Varistor Voltage	V_N	@1mA	671~829	V
Maximum Allowable Continuous DC Voltage	$V_{M(DC)}$		350	V
Maximum Allowable Continuous AC Voltage	$V_{M(AC)}$		320	V
Maximum Leakage current	I_L	@ 562VDC	5	μA
Maximum Peak Pulse Current (1 time)	I_{PP}	8/20μs	1000	A
Maximum Clamping Voltage	V_C	@I_{PP}	1050	V
Operating Temperature Range			-55 to 125	°C
Storage Temperature			-55 to 125	°C

Product Dimensions

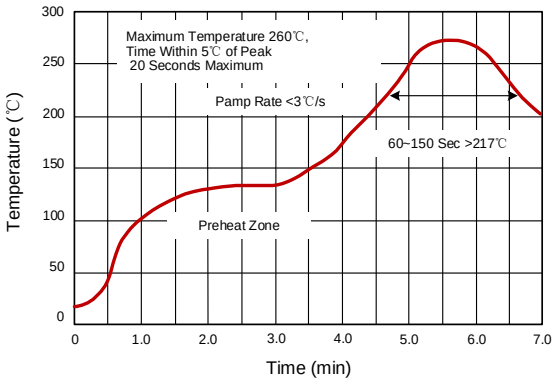


Recommended Pad Dimensions

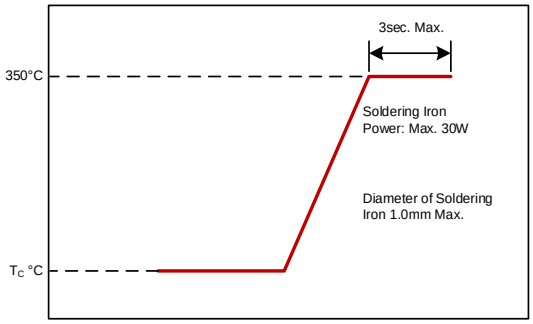
Symbol	L (mm)	W (mm)	H (mm)	S (mm)	E (mm)	A (mm)	B (mm)	C (mm)	L2 (mm)
Value	8.5±0.3	6.3±0.3	4.0±0.3	1.6±0.3	3.0±0.3	3.5 Typ.	2.8 Typ.	4.5 Typ.	10.1 Typ.

Soldering Recommendation

Lead–free Re-flow Solder Profile



Iron Soldering Profile



Storage

- ✓ Storage temperature range (packaging conditions): -10℃~+40℃ RH 70% (Max.).
- ✓ The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40℃ or less and 70% RH or less.
- ✓ The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H_2S).
- ✓ Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.
- ✓ Solderability shall be guaranteed for 12 months from the date of delivery on condition that they are stored at the environment specified in Clause 2. For those parts, which passed more than 12 months shall be checked solder-ability before use.