

Company Profile

Quality • Reliability
Cost-Down via Innovation

Established in 1969, First Resistor & Condenser Co., Ltd. (Firstohm) is specialized in thin-film resistors. Backed by strong in-house research and development capability and manufacturing technology acquired from major partners in Japan and the US, Firstohm has pioneered the development in various types of resistors in response to the changing environment of global technologies.

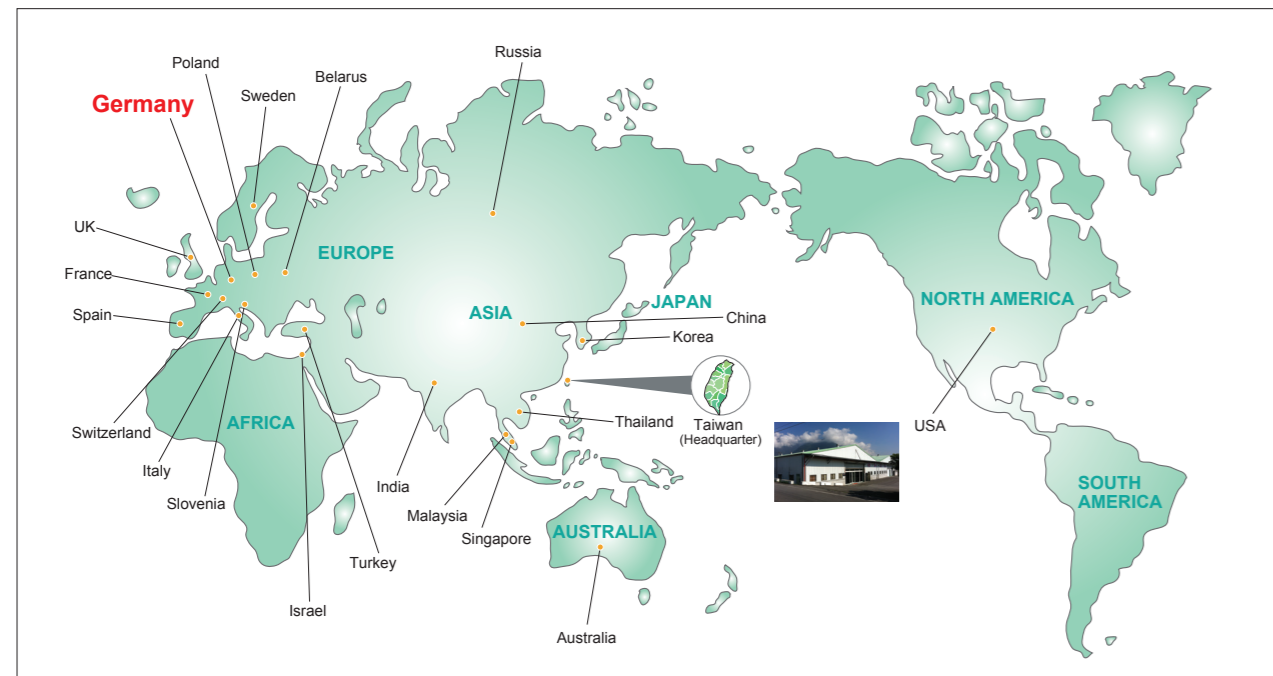
Philosophy and Mission

Given the fast-developing technology landscape, the ability of component manufacturers to evolve and provide quality parts in time has become increasingly crucial to introduction of new electronic products. Our goal at Firstohm is to constantly pursue innovation and to provide customers with quality products and reliable services in a cost efficient and timely manner.

Competitive Advantages

- **Extensive range of specialty resistors** – These products include MELF resistors, surge resistors, high voltage resistors, precision resistors, and current sense resistors.
- **Customer-oriented** – Firstohm is able to customize products and services according to customer's special requirement.
- **In-house research and development capability** – This enables Firstohm's swift responses to the market trend.
- **Solution provider** – To ensure optimal outcome, Firstohm closely collaborates with the customers from the initial technical consulting to the final resistor product selection.

Global Reach (The biggest market : Germany)



Metal Film MELF Resistors (Vehicle grade)

	Type	Power Rating at 70°C	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Temperature Coefficient
	MM102	0.2W	150V	300V	0Ω, 0.22Ω	2.2MΩ	±0.5% ~ ±5%	±25PPM ±50PPM ±100PPM
	MM204V	0.25W	200V	400V	0.47Ω	10MΩ	±1% ~ ±5%	±25PPM ±100PPM
	MM52V	0.5W	300V	500V	0.47Ω	10MΩ	±1% ~ ±5%	
	MMP204V	0.25W	200V	400V	10Ω	1MΩ	±0.5%	±5PPM ±50PPM
					22Ω	1MΩ	±0.25%	
	MMP52V	0.5W	300V	500V	10Ω	1MΩ	±0.5%	
					15Ω	1MΩ	±0.25%	
	SFP204V	0.4W	200V	400V	0.22Ω	1MΩ	±1% ~ ±5%	±25PPM ±50PPM
	SFP101V	1W	350V	700V	0.5Ω	1MΩ	±1% ~ ±5%	
	SFP201V	2W	400V	800V	0.5Ω	1MΩ	±1% ~ ±5%	
	SFP301V	3W	400V	800V	0.5Ω	1MΩ	±1% ~ ±5%	

Anti-Surge MELF Resistors (Vehicle Grade)

	Type	Power Rating at 70°C	Maximum Working Voltage	Maximum Permissible Surge Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Temperature Coefficient
	SRM204	0.25W	400V	2,000V	1Ω	1MΩ	±1% ~ ±5%	±200PPM ±400PPM
	SRM204T	0.5W	450V	4,000V	1Ω	10MΩ	±1% ~ ±5%	
	SRM207P	0.5W	600V	8,000V	0.1Ω	2M2Ω	±1% ~ ±5%	
	SRM101T	1W	600V	10,000V	0.1Ω	2M2Ω	±1% ~ ±5%	
	SRM201	2W	700V	9,000V	0.1Ω	2M2Ω	±1% ~ ±5%	
	SRM301	3W	800V	10,000V	0.1Ω	2M2Ω	±1% ~ ±5%	
	SWM100	1W	350V	7,500V	0.1Ω	1.2KΩ	±5%	±100PPM
	SWM200	2W	400V	8,500V	0.1Ω	1.2KΩ	±5%	
	SWM300	3W	400V	9,000V	0.1Ω	1.2KΩ	±5%	
	SWM400	4W	450V	11,000V	0.1Ω	1.2KΩ	±5%	

Firstohm® represented by

alfatec

alfatec GmbH & Co. KG
Meckenloher Straße 11
91126 Rednitzhembach
Germany

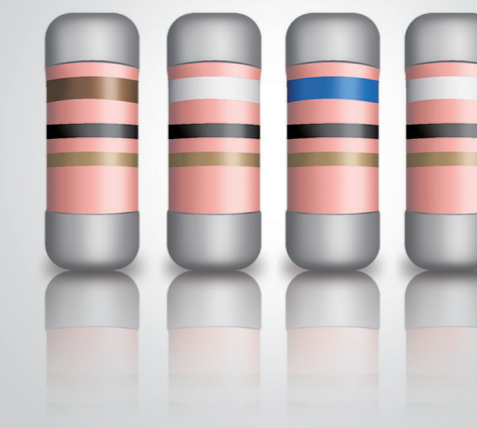
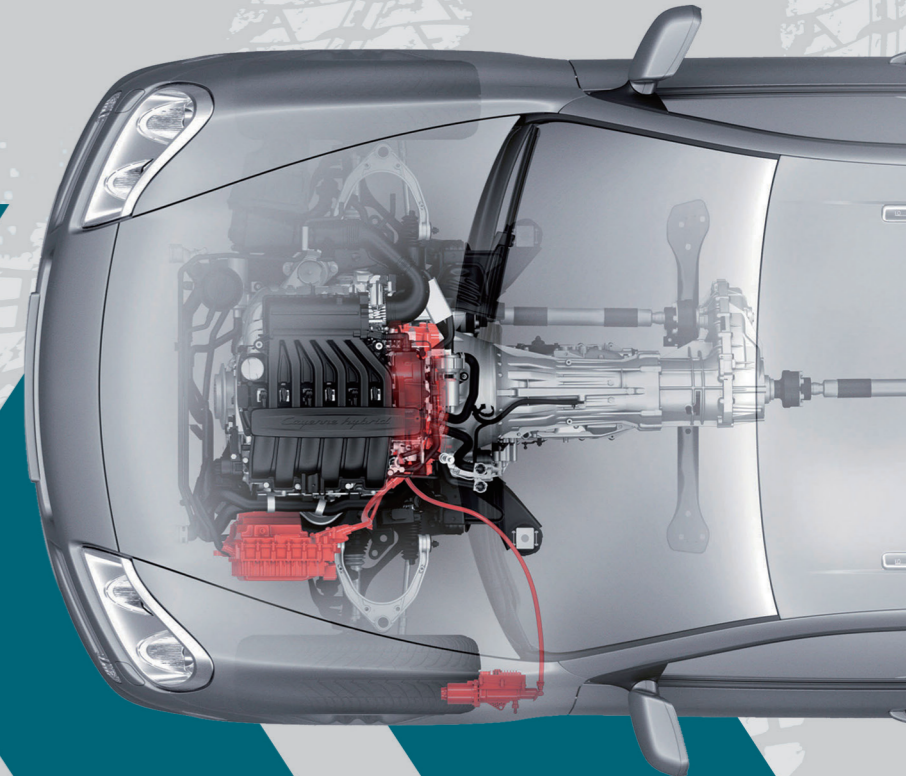
Tel.: +49 (0)9122 - 97 96 0
Fax: +49 (0)9122 - 97 96 50
E-Mail: info@alfatec.de
Web: www.alfatec.de



www.firstohm.com.tw

Firstohm® Since 1969

Resistors
(Automotive)



第一電阻電容器股份有限公司
FIRST RESISTOR & CONDENSER CO., LTD.

The Best Choice for Automotive - MELF Resistors

Vehicle Control Unit
P/N: **SRM / SWM**
(Active Discharge Resistors)

Motor Driver
P/N: **MM(V) / SFP(V)**
(IGBT Gate Resistor ; Rg)

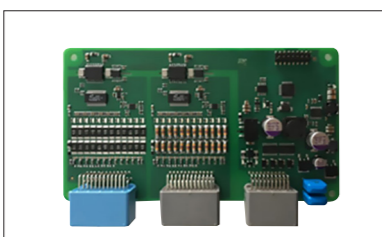
LED Lighting Units
P/N: **MM(V) / SFP(V) / SRM**

ISO7637-2/ISO16750-2 Load Dump Test
(Passed Pluse 5a Waveform)
P/N: **SWM** (Anti-Surge Wire Wound MELF Resistors)

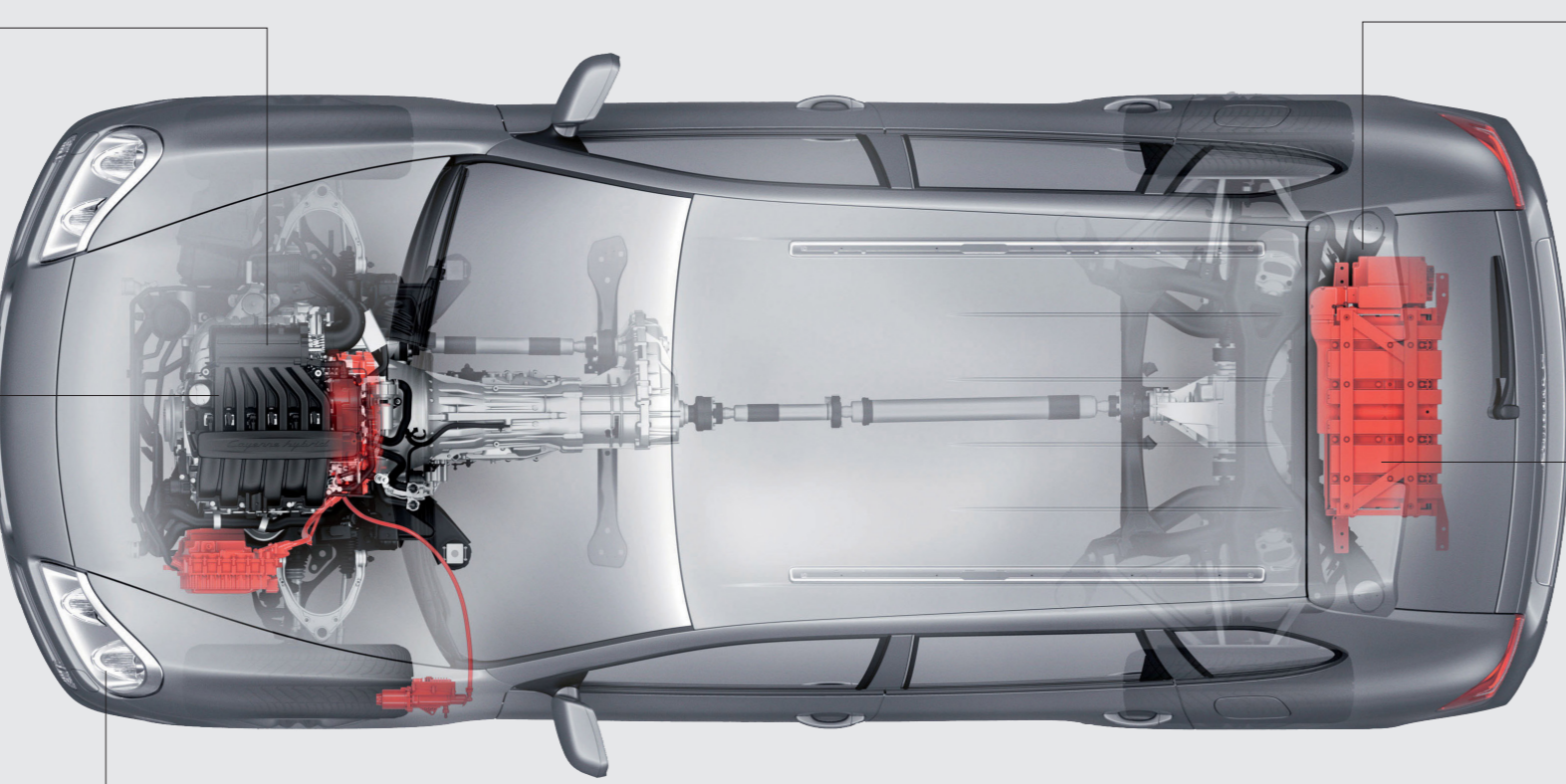
Battery Management System (BMS)
P/N: **MM(V) / MMP(V) / SFP(V)**

Advantages of MELF Resistor:

- Stronger mechanical structure to endure vibration and thermal shock.
- Excellent heat dissipation. (Especially for air cooling).
- Superior surge protection than chip resistors (Surge Proof).
- High stability, suitable for long period usage. (Excellent Stability).
- Excellent anti-sulfur characteristics due to Non-use of Ag.
- Low TCR, high precision.
- Low noise.

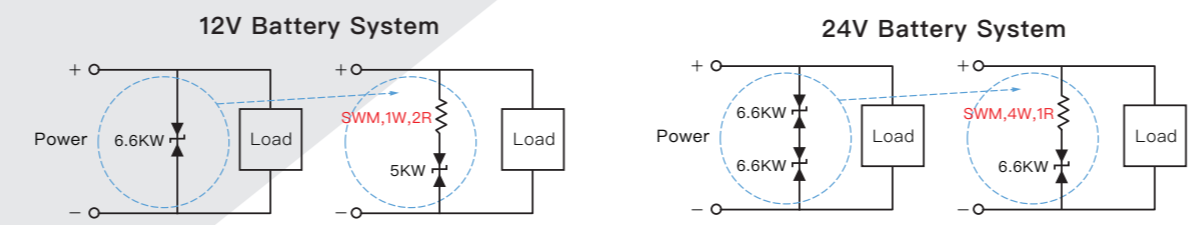


The temperature of the cylindrical MELF resistor (on the right) are significantly lower than the Chip-R (on the left)



low-cost Solution of Automotive Electronics, ISO7637-2 & ISO16750-2

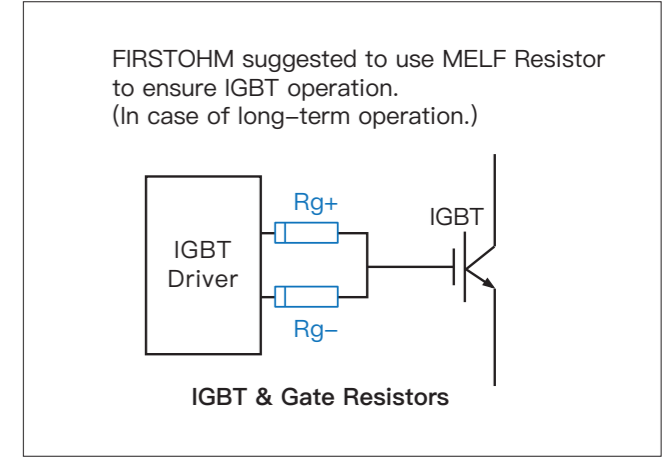
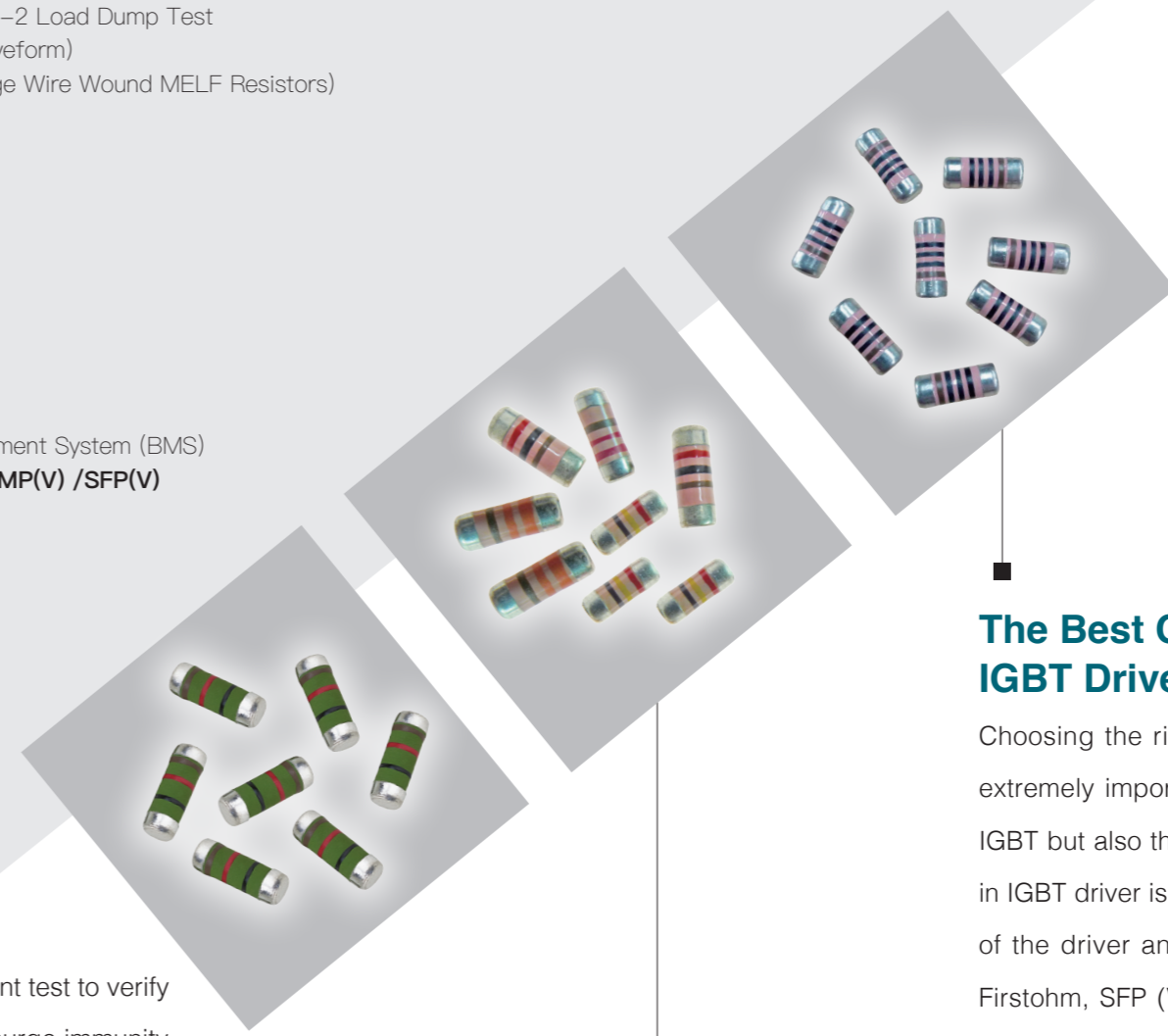
In automotive systems, electronics must pass the ISO7637 & ISO16750-2 EMC transient test to verify that the automotive electronics will not suffer from spikes and fail. In response to the surge immunity required by ISO7637 #5a, a TVS function higher than #5b must be selected to pass the test. The Firstohm is the best solution for passing the #5a test. It is recommended to use an anti-surge resistor to reduce the impact of the surge on the circuit. Therefore, the #5b TVS can be used to pass the #5a test, as follows:



Case	Waveform	Specification	Safety	Total circuit cost
Original	12V, Pulse 5a	6.6KW TVS * 1PCS (Ex. : ASTV66SM824A)	Ordinary	High
	24V, Pulse 5a	6.6KW TVS * 2PCS (Ex. : ASTV66SM824A)		
Suggested	12V, Pulse 5a	5KW TVS * 1PCS + SWM100, 2Ω	Excellent	Low
	24V, Pulse 5a	6.6KW TVS * 1PCS + SWM400, 1Ω		

Battery Management System

Due to the difference of charging and discharging time of the battery, a balancing system is crucial to extend battery life and performance. Since Firstohm MELF resistor has better heat dissipation and stability to operate longer hours than chip resistor, it is widely used in BMS passive equalization applications.



The Best Choice of the Gate Resistor in the IGBT Driver Circuit

Choosing the right gate resistor (Rg) for different IGBT characteristics is extremely important as it affects not only the dynamic performance of the IGBT but also the cost and reliability. The primary role of gate resistors (Rg) in IGBT driver is to eliminate gate-level oscillations, transfer the power losses of the driver and regulate the switching speed of the power switch. The Firstohm, SFP (V) and MM (V), complies with the AEC-Q200 specification and is the best choice for gate resistor in IGBT driver circuits.

Electric Motor Controller Solutions (Active Discharge Resistors)

It is an integral part to use capacitive components in electric motor controller circuits. The use of passive discharging large capacitors will be limited by the internal space of the controller and the limitation of the discharging resistor. There is a risk of high pressure leak by discharging over a long period of time. To avoid such risk, it is necessary to set up a rapid active capacitor discharging circuit, and discharge the capacitor quickly in an emergency.

Firstohm solution: SRM (Anti-Surge MELF Resistor)

* SRM series is certificated by VDE Lab, Germany (VDE 0868-1)

