

## World best Product

Key Components for IT & Energy industry based on advanced materials



# AMOTECH POWER MLCC's For Automotive Applications

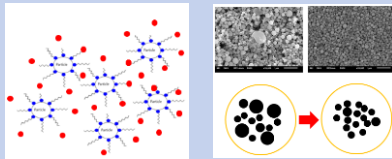
**AMO**  
A M O T E C H

# TECHNOLOGY LEADERSHIP

## Fine Material Processing

- Uniform Slurry Dispersion
- Metal Powder Classification

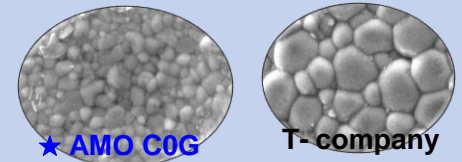
Large Size  
Large Capacitance



## Small, Uniform Grain Formation

- Fine Grain Sizes For High Voltage
- Grain Uniformity
- Ceramic Formulation Expertise

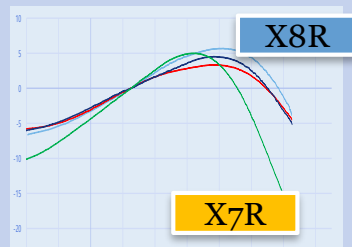
High Voltage  
High Capacitance



## TCC Control at High Temperatures

- Precise Firing Control

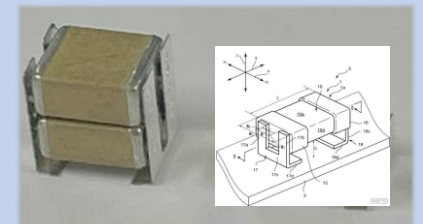
Capacitors for  
High Temperature  
Applications



## Terminal Enhancement Technology

- Metal Frame Design (Patent)
- Soft-terminals

Fail-Safe  
Capacitors

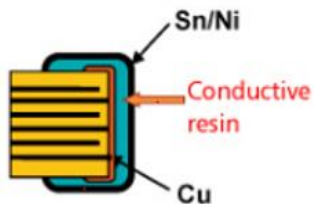


# Large Capacitance MLCC's

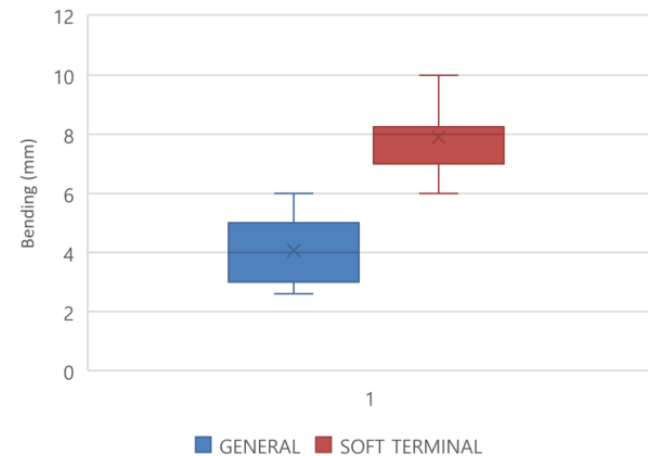
## Stable X7R, X7S Dielectrics, Higher Voltage Ratings

	T	M	Amotech	Project.
<b>0603-10uF-16V</b>	○	○	○	TSMT(Display), SYSGRATION(TPMS)
<b>0805-10uF-25V</b>	○		○	SYSGRATION(TPMS), PEGATRON(Charger)
<b>1206-10uF-50V</b>	○	○	○	TSMT(Display), QUANTA(ADAS), WNC(Camera)
<b>1210-10uF-100V</b>		○	○	QUANTA(ADAS), WNC (Radar),

## Cost Effective Soft Terminal Solutions



- Ag/Cu epoxy resin
- Nano glass



# Large-Cap. MLCC (6.3 – 100V)

## For LDC & Infotainment

➤ **ACS/AC2 SERIES**

Capacitance	Cap Code	0201" (0603mm)			0402"(1005mm)						0603"(1608mm)								0805"(2012mm)						1206"(3216mm)						1210"(3225mm)							
		6.3V	10V	16V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	200V	6.3V	10V	16V	25V	35V	50V	100V	6.3V	10V	16V	25V	35V	50V	100V	6.3V	10V	16V	25V	35V	50V	100V
1000pF	102							7R(F)	7R(F)						7R(F)	7R(F)	7R(F)							7R(F)														
4700pF	472							7R	7R									7R(F)	7R(F)	7R(F)				7R														
10000pF	103	7R	7R					7R	7R	7R					7R	7R(F)	7R(F)	7R(F)				7R	7R	7R	7R													
22000pF	223							7R	7R						7R	7R	7R							7R	7R	7R	7R											
47000pF	473							7R	7R						7R	7R	7R							7R	7R	7R	7R											
0.1µF	104	7R	7R	7R	7R	7R	7R	7R	7R			7R	7R	7R	7R	7R	7R						7R	7R	7R													
0.22µF	224				7R	7R	7R					7R	7R	7R	7R	7R								7R	7R	7R									7R	7R	7R	
0.47µF	474				7R	7R	7R					7R	7R	7R	7R	7R								7R	7R	7R									7R	7R	7R	
1µF	105				7R	7S	7S					7R	7R	7R	7R	7S							7R	7R	7R	7R	7S(T)	7R	7R	7R	7R	7R	7R		7R	7R	7R	
2.2µF	225				7R	7R						7R	7R	7R									7R	7R	7R	7R	7R	7R								7S		
4.7µF	475											7R	7R	7R									7R	7R	7R	7R	7R	7R	7R	7S(T)					7R	7R	7R	
10µF	106											7R											7R	7R	7R	7R	7R(T)	7T(T)							7R	7R	7R	
22µF	226																						7S	7S											7R	7S		
47µF	476																																				7R(T)	7S(T)
100µF	107																																					6S

➤ **Automotive grade**



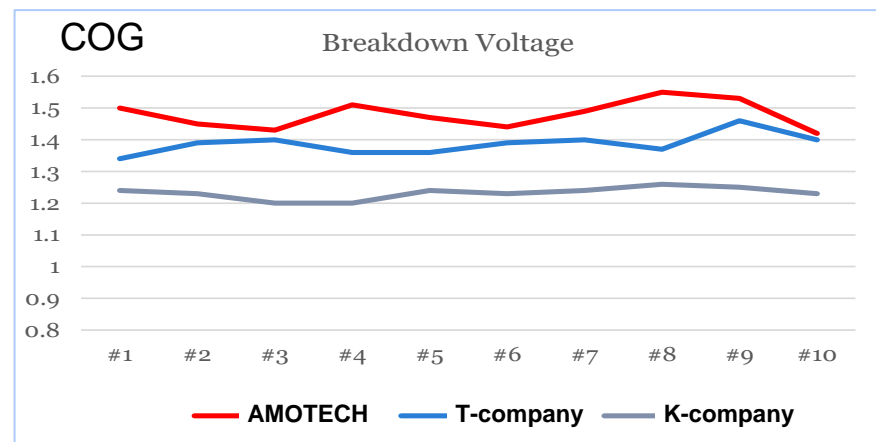
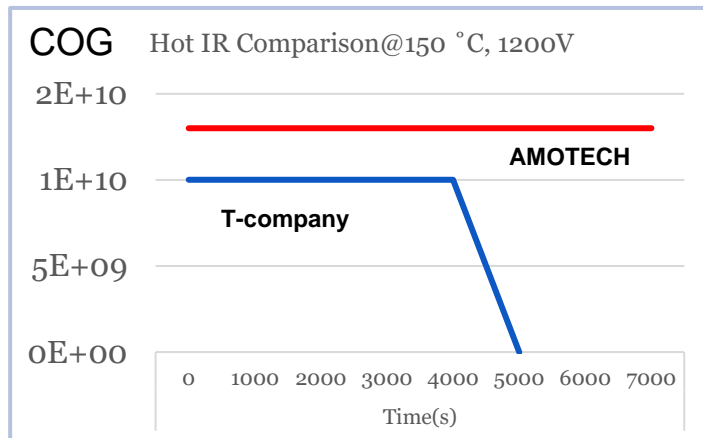
- **6S = X6S**
- **7S = X7S**
- **7R = X7R**
- **7T = X7T**
- **(T) : Soft terminal only**
- **(F) : Floating electrode**

# High Voltage MLCC's

Higher Withstanding Voltages & Superior Insulation Resistance

Replacement of Film Capacitors (Smaller Sizes, Higher Temperatures, Better Reliability)

	T	M	Amotech	Application
1206-10nF-630V-C0G	○	○	○	On Board Charger, DC-DC convertor, Invertor
1210-22nF-1000V-C0G	○	○	○	On Board Charger, DC-DC convertor, Invertor
1210-33nF-630V-C0G	○	○	○	On Board Charger, DC-DC convertor, Invertor
2220-0.6uF-630V-X7T	○	○	○	On Board Charger, Invertor
2220-1.2uF-630V-X7T	○	○	○	On Board Charger, Invertor



# Snubber capacitor (250 – 1000V)

➤ ACC SERIES

Capacitance	Cap Code	3216(1206)			3225(1210)			5750(2220)		
		250V	630V	1000V	250V	630V	1000V	250V	630V	1000V
0.1nF	101	0G	0G	0G						
0.22nF	221	0G	0G	0G						
0.33nF	331	0G	0G	0G						
0.47nF	471	0G	0G	0G						
1nF	102	0G	0G	0G	0G	0G	0G			
2.2nF	222	0G	0G	0G	0G	0G	0G			
4.7nF	472	0G	0G		0G	0G	0G			
10nF	103	0G	0G		0G	0G	0G	0G	0G	0G
22nF	223	0G			0G	0G	0G	0G	0G	0G
33nF	333				0G	0G		0G	0G	0G
47nF	473				0G			0G	0G	
100nF	104							0G	0G	
220nF	224									
470nF	474									
1.0uF	105									

➤ Automotive grade



➤ 0G = COG

# High Voltage DC-Link (1206~2220 inch)

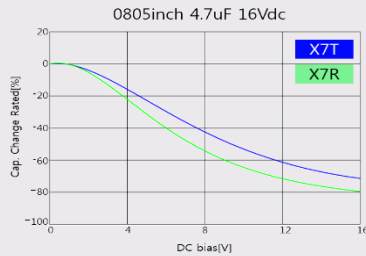
➤ AC3 SERIES



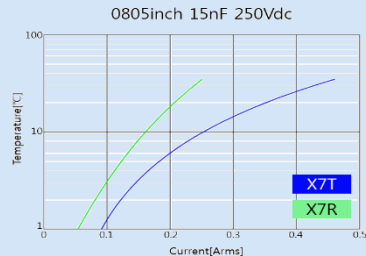
Superior DC bias characteristics

Excellent ripple current characteristics

Capacitance change vs DC Voltage



Ripple current vs Temperature



➤ Automotive grade



Capacitance	Cap Code	3216 (1206)		3225 (1210)		5750 (2220)	
		250V	630V	250V	630V	250V	630V
10nF	103	7T	7T	7T	7T		7T
15nF	153	7T	7T	7T	7T		7T
22nF	223	7T		7T	7T		7T
47nF	473	7T		7T	7T		7T
68nF	683	7T		7T			7T
100nF	104			7T		7T	7T
150nF	154			7T		7T	7T
220nF	224					7T	7T
330nF	334					7T	7T
470nF	474					7T	7T
1000nF	105					7T	7T
1200nF	125					7T	7T
2200nF	225					7T	

\* For 5750(2220) size, metal frame option available

➤ 7T = X7T

# High Temperature MLCC's

Superior Temperature Characteristics at 150 °C

High Insulation Resistance at High Temperatures

Dielectric Material	Size		WVDC	Capacitance	Status
	EIA (inch)	JIS (mm)			
X8L	0603-1210	1608-3225	100V	10uF	Mass Production
X8R	0603-1210	1608-3225	100V	4.7uF	End of 2022
X8G	0603-0805	1608-2012	100V	10nF	Mass Production



# ESD Protection MLCC's

Superior ESD Protection based on IEC 61000-4-2

High Insulation Resistance with High Voltage Ratings

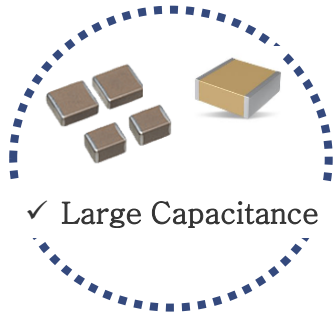
	T	M	Amotech	Application
ESD CAPACITOR	○	-	○	- Remote Key Entry, Sensor Networks

Size		WVDC	Dielectric Material	Capacitance	ESD level
EIA (inch)	JIS (mm)				
0603	1608	100V	COG/X8G	1.0-10nF	8-30kV

# Capacity Plan

Expected to double every year.

Unit : Million pcs / month



Total Capacity		x 2	Total Capacity		x 2	Total Capacity	
5,000 M/m		→	10,000 M/m		→	20,000 M/m	
01005	800		01005	1,500		01005	2,500
0201	1,500		0201	3,500		0201	7,500
0402	2,000		0402	3,500		0402	6,500
0603	400		0603	1,000		0603	2,000
0805	200		0805	300		0805	1,000
1206 (& bigger)	100		1206 (& bigger)	200		1206 (& bigger)	500



# Quality Management System

## ■ IATF16949

Certificate No : RTS0053-1  
IATF Certificate No : 0386853  
Page : 1/2



Certificate of Registration

### QUALITY MANAGEMENT SYSTEM

This is to certify that  
the quality management system of

**AMOTECH CO.,LTD.**

at

#380, Namdongseo-ro, Namdong-gu, Incheon, 21629, Korea

Has been found to conform to the Quality Management System Standards:

*IATF 16949:2016*

This Certificate is valid for the following product or service ranges:

*Design and Manufacturing of Multi-layer Ceramic,  
Dielectric Ceramic and Antenna*

Permitted exclusion: NA

Issue Date : Feb. 24, 2021

Certification Date : Feb. 24, 2021

Expiration Date : Feb. 23, 2024



Korea Management Registrar  
146ang, 12F, Ase High Tech City #775, Gyeonggi-do  
Yonglaksong-gu, Seoul, 07299, Korea  
T: 82-2-6309-9001 / F: 82-2-6309-9004

Mark indicates that KMR is accredited by the IATF for Quality Management Systems.  
Initial certification date: Mar. 5, 2007 / Latest issue date: Feb. 24, 2021

Authorized By *E J Hwang*  
Eun-Ju Hwang, President

## ■ ISO14001

Certificate No : REM0892



Certificate of Registration

### ENVIRONMENTAL MANAGEMENT SYSTEM

This is to certify that  
the environmental management system of

**AMOTECH Co.,Ltd.**

at

Head Office: #380, Namdongseo-ro, Namdong-gu, Incheon, Korea  
Poseung Plant: #27, Pyeongtaekhang-ro 184beon-gil, Poseung-eup, Pyeongtaek-si, Gyeonggi, Korea  
Geomdan Plant: #57, Geomdan-ro, Seo-gu, Incheon, Korea

Has been found to conform to the Environmental Management System Standards:

*KS I ISO 14001:2015/ISO 14001:2015*

This Certificate is valid for the following product or service ranges:

*1. Design, Development and Manufacture of  
Multi-Layer Ceramic and Dielectric Ceramic for Mobile Phone,  
Automobile, Computer, Network, Home Appliance Industry  
2. Design, Development and Manufacture of Functional Ceramic*

Issue Date : Feb. 4, 2021

Certification Date : Oct. 5, 2020

Valid Date : Oct. 4, 2023



Korea Management Registrar  
146ang, 12F, Ase High Tech City #775, Gyeonggi-do  
Yonglaksong-gu, Seoul, 07299, Korea  
T: 82-2-6309-9001 / F: 82-2-6309-9004

Mark indicates that KMR is accredited by the number of the International Accreditation Forum Multilateral Recognition Arrangement.  
KMSC CODE:19/ Initial certification date: Oct. 5, 2005

Authorized By *E J Hwang*  
Eun-Ju Hwang, President

## ■ ISO45001

Certificate No : ROH1306



Certificate of Registration

### OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM

This is to certify that  
the occupational health and safety management system of

**AMOTECH CO.,LTD.**

at

#380, Namdongseo-ro, Namdong-gu, Incheon, Korea

Has been found to conform to the Occupational Health and Safety Management System Standards:

*KS Q ISO 45001:2018/ISO 45001:2018*

This Certificate is valid for the following product or service ranges:

*Design, Development and Manufacture of  
Multi-Layer Ceramic and Dielectric Ceramic for  
Mobile Phone, Automobile, Computer, Network, Home Appliance Industry*

Issue Date : Dec. 13, 2019

Certification Date : Dec. 13, 2019

Valid Date : Dec. 12, 2022



Korea Management Registrar  
146ang, 12F, Ase High Tech City #775, Gyeonggi-do  
Yonglaksong-gu, Seoul, 07299, Korea  
T: 82-2-6309-9001 / F: 82-2-6309-9004

Mark is accredited by the KAB (No. KAB-OC-12)  
KMSC CODE:19/ Initial certification date: Dec. 13, 2019

Authorized By *E J Hwang*  
Eun-Ju Hwang, President