

# Automotive Capacitors for Power Train/Safety Applications



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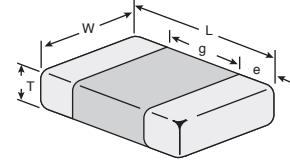
## GCM SERIES

Modern vehicle design is driven by the need for increased comfort, safety and security. As a result, automobiles are becoming intelligent and increasingly reliant upon electronics. In the automotive sector, Murata's products are used in communication, safety, information, and power train systems, just to name a few. The acceptance of Murata's capacitor products in these applications is based upon the core competencies of Murata - ceramic material and processing technology. Murata's GCM series is designed for the more rigorous demands of safety, under-hood, and power train systems. The GCM series is designed specifically to meet the test conditions of the AEC-Q200.

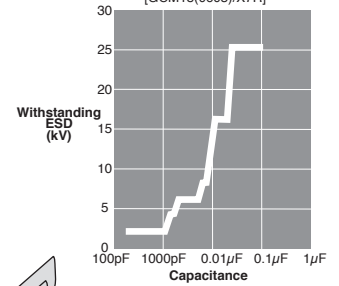
### Features:

- Meets AEC-Q200 requirements
- GCM15 and 32 types are suited for only reflow soldering
- GCM18, 21, and 31 types are suited for flow and reflow soldering
- GCM Series is offered with a nickel (Ni) barrier termination finished with matte tin (Sn) plating
- Available in paper or embossed tape and reel packaging for automatic placement

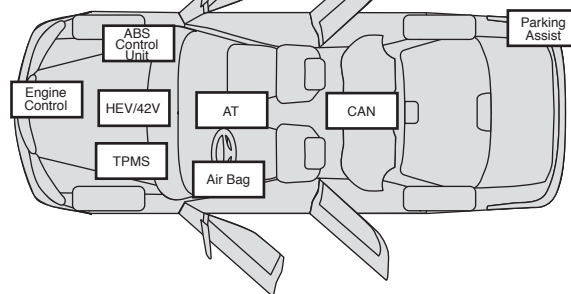
Part No.	Dimensions: mm				
	Length (L)	Width (W)	Thickness (T)	e (Min.)	g (Min.)
GCM1555	1.0±0.05	0.5±0.05	0.5±0.05	0.15 to 0.3	0.4
GCM1888	1.6±0.1	0.8±0.1	0.8±0.1	0.2 to 0.5	0.5
GCM219	2.0±0.15	1.25±0.15	0.85±0.1	0.2 to 0.7	0.7
GCM21A	2.0±0.2	1.25±0.2	1.0±0.3	0.3	0.7
GCM21B	2.0±0.2	1.25±0.2	1.25±0.15	0.2 to 0.7	0.7
GCM319	3.2±0.15	1.6±0.15	0.85±0.1	0.3 to 0.8	1.5
GCM31A	3.2±0.2	1.6±0.2	1.25±0.3	0.3	1.5
GCM31B	3.2±0.2	1.6±0.2	1.25±0.3	0.3	1.2
GCM31C	3.2±0.2	1.6±0.2	1.6±0.2	0.3 to 0.8	1.5
GCM31M	3.2±0.15	1.6±0.15	1.15±0.1	0.3 to 0.8	1.5
GCM32A	3.2±0.2	2.5±0.2	1.0±0.3	0.3	1.5
GCM32E	3.2±0.3	2.5±0.2	2.5±0.2	0.3	1.0



INNOVATOR IN ELECTRONICS  
ESD level based on AEC-Q200 test method (GCM18(0603)/X7R)



### Application Guide:



Temperature Characteristics				
Code	Temperature Coefficient	Temperature Range	Capacitance Change	Operating Temperature Range
5C	COG	25° to 125°C	±30ppm/°C	-55°C to +125°C
7U	U2J	25° to 125°C	-750+120ppm/°C	-55°C to +125°C
R7	X7R	-55°C to +125°C	±15%	-55°C to +125°C

MOUSER STOCK NO.	Murata Part No.	Value (pF)	Volt (DC)	Tol. (±)	Price Each	
					1	100
0402 Case Size, COG Temperature Coefficient						
81-GCM1555C1H151J16D	GCM1555C1H151JA16D	150	50	5%	.10	.013
81-GCM1555C1H221J16D	GCM1555C1H221JA16D	220	50	5%	.10	.013
81-GCM1555C1H331J16D	GCM1555C1H331JA16D	330	50	5%	.10	.013
81-GCM1555C1H471J16D	GCM1555C1H471JA16D	470	50	5%	.10	.023
0402 Case Size, X7R Temperature Coefficient						
81-GCM1557R1H221K37D	GCM1557R1H221KA37D	220	50	10%	.10	.012
81-GCM1557R2A221K37D	GCM1557R2A221KA37D	220	100	10%	.10	.019
81-GCM1557R1H471K37D	GCM1557R1H471KA37D	470	50	10%	.10	.012
81-GCM1557R2A471K37D	GCM1557R2A471KA37D	470	100	10%	.10	.009
81-GCM1557R1H102KA7D	GCM1557R1H102KA37D	1000	50	10%	.10	.008
81-GCM1557R2A102KA7D	GCM1557R2A102KA37D	1000	100	10%	.10	.009
81-GCM1557R1H222K37D	GCM1557R1H222KA37D	2200	50	10%	.10	.008
81-GCM1557R2A222K37D	GCM1557R2A222KA37D	2200	100	10%	.10	.021
81-GCM1557R1H472K37D	GCM1557R1H472KA37D	4700	50	10%	.10	.008
81-GCM1557R2A472K37D	GCM1557R2A472KA37D	4700	100	10%	.10	.021
81-GCM1557R1H103KA5D	GCM1557R1H103KA55D	10000	50	10%	.10	.008
81-GCM1557R1H223KA5D	GCM1557R1H223KA55D	22000	50	10%	.10	.013
81-GCM1557R1E473KA5D	GCM1557R1E473KA55D	47000	25	10%	.10	.013
81-GCM1557R1C104KA5D	GCM1557R1C104KA55D	0.1µF	16	10%	.10	.016

0603 Case Size, COG Temperature Coefficient						
MOUSER STOCK NO.	Murata Part No.	Value (pF)	Volt (DC)	Tol. (±)	Price Each	
					1	100
81-GCM1885C1H100JA6D	GCM1885C1H100JA16D	10	50	5%	.10	.018
81-GCM1885C2A100JA6D	GCM1885C2A100JA16D	10	100	5%	.10	.015
81-GCM1885C1H150JA6D	GCM1885C1H150JA16D	15	50	5%	.10	.013
81-GCM1885C2A150JA6D	GCM1885C2A150JA16D	15	100	5%	.10	.03
81-GCM1885C1H220JA6D	GCM1885C1H220JA16D	22	50	5%	.10	.015
81-GCM1885C2A220JA6D	GCM1885C2A220JA16D	22	100	5%	.10	.03
81-GCM1885C1H330JA6D	GCM1885C1H330JA16D	33	50	5%	.10	.015
81-GCM1885C2A330JA6D	GCM1885C2A330JA16D	33	100	5%	.10	.018
81-GCM1885C1H470JA6D	GCM1885C1H470JA16D	47	50	5%	.10	.015
81-GCM1885C2A470JA6D	GCM1885C2A470JA16D	47	100	5%	.10	.018
81-GCM1885C1H680JA6D	GCM1885C1H680JA16D	68	50	5%	.10	.015
81-GCM1885C2A680JA6D	GCM1885C2A680JA16D	68	100	5%	.10	.03
81-GCM1885C1H101JA6D	GCM1885C1H101JA16D	100	50	5%	.10	.015
81-GCM1885C2A101JA6D	GCM1885C2A101JA16D	100	100	5%	.10	.025
81-GCM1885C1H151JA6D	GCM1885C1H151JA16D	150	50	5%	.10	.018
81-GCM1885C2A151JA6D	GCM1885C2A151JA16D	150	100	5%	.10	.029
81-GCM1885C1H221JA6D	GCM1885C1H221JA16D	220	50	5%	.10	.018
81-GCM1885C2A221JA6D	GCM1885C2A221JA16D	220	100	5%	.10	.024
81-GCM1885C1H331JA6D	GCM1885C1H331JA16D	330	50	5%	.11	.032
81-GCM1885C2A331JA6D	GCM1885C2A331JA16D	330	100	5%	.13	.038
81-GCM1885C1H471JA6D	GCM1885C1H471JA16D	470	50	5%	.10	.018
81-GCM1885C2A471JA6D	GCM1885C2A471JA16D	470	100	5%	.10	.024
81-GCM1885C1H681JA6D	GCM1885C1H681JA16D	680	50	5%	.10	.018
81-GCM1885C2A681JA6D	GCM1885C2A681JA16D	680	100	5%	.16	.046
81-GCM1885C1H102JA6D	GCM1885C1H102JA16D	1000	50	5%	.12	.032
81-GCM1885C2A102JA6D	GCM1885C2A102JA16D	1000	100	5%	.12	.034
81-GCM1885C1H152JA6D	GCM1885C1H152JA16D	1500	50	5%	.11	.032
81-GCM1885C2A152JA6D	GCM1885C2A152JA16D	1500	100	5%	.21	.059
81-GCM1885C1H222JA6D	GCM1885C1H222JA16D	2200	50	5%	.11	.03

0603 Case Size, X7R Temperature Coefficient						
MOUSER STOCK NO.	Murata Part No.	Value (pF)	Volt (DC)	Tol. (±)	Price Each	
					1	100
81-GCM1887R1H102KA7D	GCM1887R1H102KA37D	1000	50	10%	.10	.014
81-GCM1887R2A102KA7D	GCM1887R2A102KA37D	1000	100	10%	.10	.015
81-GCM1887R1H222K37D	GCM1887R1H222KA37D	2200	50	10%	.10	.01
81-GCM1887R2A222K37D	GCM1887R2A222KA37D	2200	100	10%	.10	.023
81-GCM1887R1H472K37D	GCM1887R1H472KA37D	4700	50	10%	.10	.014
81-GCM1887R2A472K37D	GCM1887R2A472KA37D	4700	100	10%	.10	.015
81-GCM1887R1H103KA7D	GCM1887R1H103KA37D	10000	50	10%	.10	.014
81-GCM1887R2A103KA7D	GCM1887R2A103KA37D	10000	100	10%	.10	.015
81-GCM1887R1H223K37D	GCM1887R1H223KA37D	22000	50	10%	.10	.013
81-GCM1887R2A223KA7D	GCM1887R2A223KA37D	22000	100	10%	.10	.03

MOUSER STOCK NO.	Murata Part No.	Value (pF)	Volt (DC)	Tol. (±)	Price Each	
					1	100
0603 Case Size, X7R Temperature Coefficient (Cont.)						
81-GCM1887R1H473KA5D	GCM1887R1H473KA55D	47000	50	10%	.10	.027
81-GCM1887R1C104KA7D	GCM1887R1C104KA37D	0.1µF	16	10%	.10	.013
81-GCM1887R1H104KA7D	GCM1887R1H104KA57D	0.1µF	50	10%	.10	.027
81-GCM1887R1E224KA5D	GCM1887R1E224KA55D	0.22µF	25	10%	.10	.024
81-GCM1887R1C474KA5D	GCM1887R1C474KA55D	0.47µF	16	10%	.12	.032
81-GCM1887R1E474KA4D	GCM1887R1E474KA64D	0.47µF	25	10%	.17	.051
0805 Case Size, COG Temperature Coefficient						
81-GCM2165C2A222J16D	GCM2165C2A222JA16D	2200	100	5%	.19	.054
81-GCM2165C2A332J16D	GCM2165C2A332JA16D	3300	100	5%	.25	.073
81-GCM2165C1H472J16D	GCM2165C1H472JA16D	4700	50	5%	.23	.068
81-GCM2195C1H682J16D	GCM2195C1H682JA16D	6800	50	5%	.32	.101
81-GCM2195C1H103JA6D	GCM2195C1H103JA16D	0.01µF	50	5%	.25	.071
0805 Case Size, X7R Temperature Coefficient						
81-GCM21BR72A473K37L	GCM21BR72A473KA37L	47000	100	10%	.12	.032
81-GCM21BR72A104KA7L	GCM21BR72A104KA37L	0.1µF	100	10%	.15	.04
81-GCM21BR71H224K37L	GCM21BR71H224KA37L	0.22µF	50	10%	.25	.071
81-GCM21BR71H474KA5L	GCM21BR71H474KA55L	0.47µF	50	10%	.28	.09
81-GCM21BR71E105KA6L	GCM21BR71E105KA66L	1.0µF	25	10%	.21	.061
81-GCM21BR71C225KA64L	GCM21BR71C225KA64L	2.2µF	16	10%	.22	.061
81-GCM21BR71E225KA3L	GCM21BR71E225KA37L	2.2µF	25	10%	.35	.108
0805 Case Size, U2J Temperature Coefficient						
81-GCM21A7U2E101JX1D	GCM21A7U2E101JX01D	100	250	5%	.35	.125
81-GCM21A7U2E151JX1D	GCM21A7U2E151JX01D	150	250	5%	.39	.138
81-GCM21A7U2E221JX1D	GCM21A7U2E221JX01D	220	250	5%	.40	.142
81-GCM21A7U2E331JX1D	GCM21A7U2E331JX01D	330	250	5%	.45	.159
81-GCM21A7U2E471JX1D	GCM21A7U2E471JX01D	470	250	5%	.52	.186
81-GCM21A7U2E681JX1D	GCM21A7U2E681JX01D	680	250	5%	.52	.186
81-GCM21A7U2E102JX1D	GCM21A7U2E102JX01D	1000	250	5%	.52	.186
81-GCM21A7U2E222JX1D	GCM21A7U2E222JX01D	2200	250	5%	.52	.186
1206 Case Size, COG Temperature Coefficient						
81-GCM3195C2A472J16D	GCM3195C2A472JA16D	4700	100	5%	.39	.14
81-GCM3195C2A103J16D	GCM3195C2A103JA16D	10000	100	5%	.48	.189
81-GCM3195C1H223JA6D	GCM3195C1H223JA16D	22000	50	5%	.50	.176
1206 Case Size, X7R Temperature Coefficient						
81-GCM31MR72A224K37L	GCM31MR72A224KA37L	0.22µF	100	10%	.33	.105
81-GCM31MR71H105KA5L	GCM31MR71H105KA55L	1.0µF	50	10%	.28	.09
81-GCM31CR71H225KA5L	GCM31CR71H225KA55L	2.2µF	50	10%	.36	.126
81-GCM31CR71E475KA5L	GCM31CR71E475KA55L	4.7µF	25	10%	.34	.105
81-GCM31CR71A106KA4L	GCM31CR71A106KA64L	10µF	10	10%	.36	.126
81-GCM31CR71C106KA4L	GCM31CR71C106KA64L	10µF	16	10%	.46	.244
81-GCM31CR70J226KE3L	GCM31CR70J226KE23L	22µF	6.3	10%	.87	.338
1206 Case Size, U2J Temperature Coefficient						
81-GCM31A7U2J150JX1D	GCM31A7U2J150JX01D	15	630	5%	.51	.20
81-GCM31A7U2J330JX1D	GCM31A7U2J330JX01D	33	630	5%	.51	.20
81-GCM31A7U2J470JX1D	GCM31A7U2J470JX01D	47	630	5%	.55	.196
81-GCM31A7U2J101JX1D	GCM31A7U2J101JX01D	100	630	5%	.50	.179
81-GCM31A7U2J21JX1D	GCM31A7U2J21JX01D	220	630	5%	.53	.187
81-GCM31A7U2J331JX1D	GCM31A7U2J331JX01D	330	630	5%	.53	.187
81-GCM31A7U2J681JX1D	GCM31A7U2J681JX01D	680	630	5%	.48	.189
81-GCM31A7U2J102JX1D	GCM31A7U2J102JX01D	1000	630	5%	.50	.197
81-GCM31A7U2E472JX1D	GCM31A7U2E472JX01D	4700	250	5%	.49	.192
81-GCM31B7U2E103JX1D	GCM31B7U2E103JX01D	10000	250	5%	.60	.235
1210 Case Size, X7R Temperature Coefficient						
81-GCM32DR72A225K64L	GCM32DR72A225KA64L	2.2µF	100	10%	.90	.376
81-GCM32ER71H475KA5L	GCM32ER71H475KA55L	4.7µF	50	10%	1.23	.55
81-GCM32ER71E106KA5L	GCM32ER71E106KA57L	10µF	25	10%	.88	.364
81-GCM32ER71A226KE2L	GCM32ER71A226KE12L	22µF	10	10%	1.59	.762
1210 Case Size, U2J Temperature Coefficient						
81-GCM32A7U2J222JX1D	GCM32A7U2J222JX01D	2200	630	5%	1.05	.437