RoHS Available

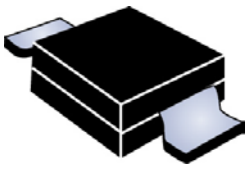
600 Watt Surface Mount Transient Voltage Suppressor

Screening in reference to MIL-PRF-19500 available

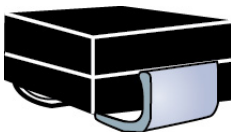
DESCRIPTION

The MSMB 5.0A – MSMB 170CA series of surface mount 600 watt transient voltage suppressors provide a selection of standoff voltages (Vwm) from 5.0 to 170 V. These high-reliability devices are available in either unidirectional or bidirectional versions. The SMBG Gull-wing design in the DO-215AA package is ideal for visible solder connections. The SMBJ J-bend design in the DO-214AA package allows for greater PC board mounting density. It is available with SnPb or RoHS compliant matte-tin plating.

Important: For the latest information, visit our website http://www.microsemi.com.



DO-215AA
Gull-wing Package



DO-214AA
J-bend Package

NOTE: All SMB series are equivalent to prior SMS package identifications.

FEATURES

- High reliability devices with wafer fabrication and assembly lot traceability.
- All devices 100% surge tested.
- Enhanced reliability screening in reference to MIL-PRF-19500 is also available.
  Refer to High Reliability Up-Screened Plastic Products Portfolio for more details on the screening options.
  (See part nomenclature for all options.)
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B.
- 3σ lot norm screening performed on standby current (I_D).
- RoHS compliant versions available.

APPLICATIONS / BENEFITS

- Protects sensitive components such as IC's, CMOS, Bipolar, BiCMOS, ECL, DTL, T2L, etc.
- Protection from switching transients & RF induced voltage pulses.
- Protection from ESD and EFT per IEC 61000-4-2 and IEC 61000-4-4.
- Secondary lightning protection per IEC61000-4-5 with 42 ohms source impedance:
  - Class 1: MSB 5.0A to MSMB 120CA
  - Class 2: MSMB 5.0A to MSMB 60CA
  - Class 3: MSMB 5.0A to MSMB 30CA
  - Class 4: MSMB 5.0A to MSMB 15CA
- Secondary lightning protection per IEC61000-4-5 with 12 ohms source impedance:
  - Class 1: MSMB 5.0A to MSMB 36CA
  - Class 2: MSMB 5.0A to MSMB 18CA

MAXIMUM RATINGS @ 25 ºC unless otherwise stated

Parameters/Test Conditions		Symbol	Value	Unit
Junction and Storage Temperature		T_J and T_{STG}	-65 to +150	°C
Thermal Resistance, Junction to Lead		$R_{\Theta JL}$	25	°C/W
Thermal Resistance, Junction to Ambient (1)		$R_{\Theta JA}$	90	°C/W
Peak Pulse Power Dissipation (2)	10/1000us	P_{PP}	600	W
Rated Average Power Dissipation (1)	@ $T_L \leq 25$ ºC @ $T_A = 25$ ºC	$P_{M(AV)}$	5 1.38	W
$T_{clamping}$ (0 volts to $V_{(BR)}$ min)	Unidirectional Bidirectional		< 100 < 5	ps ns
Forward Surge Current (3)		I_{FS}	100	A (pk)
Solder Temperature @ 10 s		T_{SP}	260	°C

Notes:
1. When mounted on FR4 PC board (1oz Cu) with recommended footprint (see pad layout on last page).
2. With impulse repetition rate (duty factor) of 0.01 % or less (also Figure 1 and 4).
3. Peak impulse of 8.3 ms half-sine wave (unidirectional only).

Also available in:

Commercial Grade
SMBJ5.0A – SMBJ170CAe3

T-18 package
(axial-leaded)
P6KE6.8A – P6KE200CAe3

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

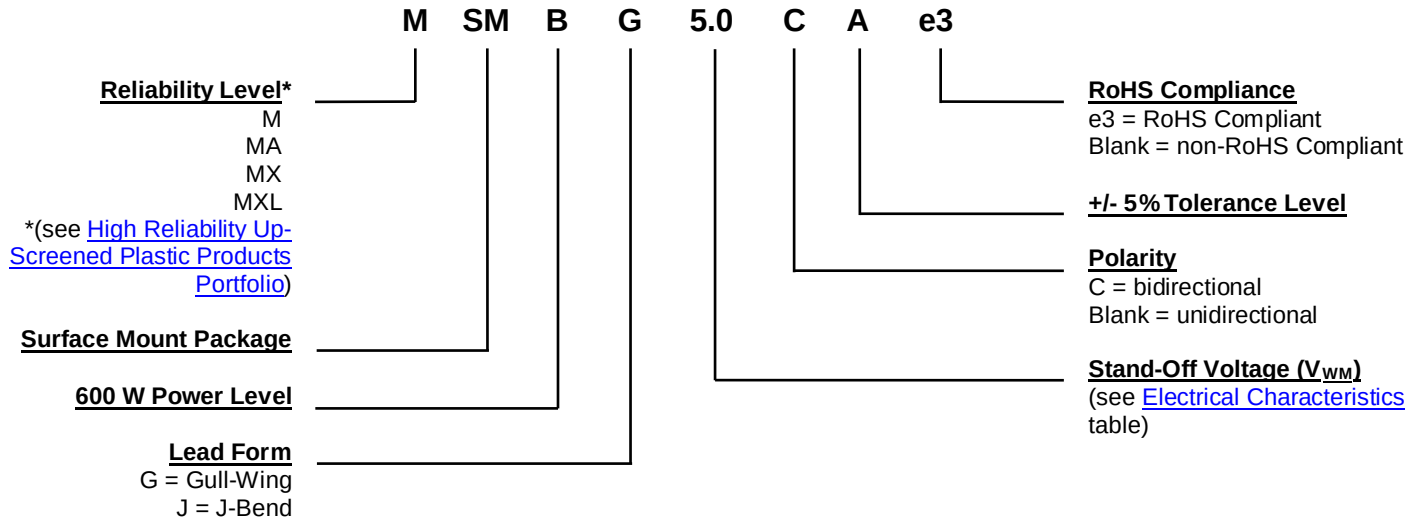
Website:
www.microsemi.com

©2013 Microsemi Corporation

MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0 requirements.
- TERMINALS: Tin-lead or RoHS compliant annealed matte-tin plating readily solderable per MIL- STD-750, method 2026.
- MARKING: Part number.
- POLARITY: Cathode end banded.
- TAPE & REEL option: Standard per EIA-481-1-A (add "TR" suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 0.1 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

Symbol	Definition
V_{WM}	Working Peak (Standoff) Voltage - The maximum peak voltage that can be applied over the operating temperature range. This is also referred to as standoff voltage.
P_{PP}	Peak Pulse Power - Rated random recurring peak impulse power dissipation.
$V_{(BR)}$	Breakdown Voltage - The minimum voltage the device will exhibit at a specified current.
I_D	Standby Current - The current at the rated standoff voltage (V_{WM}).
I_{PP}	Peak Pulse Current - The peak current during the impulse.
V_C	Clamping Voltage - Clamping voltage at I_{PP} (peak pulse current) at the specified pulse conditions (typically shown as maximum value).
I_{BR}	Breakdown Current – The current used for measuring breakdown voltage $V_{(BR)}$.

©2013 Microsemi Corporation

ELECTRICAL CHARACTERISTICS @ 25 ºC

PART NUMBER		REVERSE STAND-OFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE $V_{(BR)}$ @ $I_{(BR)}$		MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	PEAK PULSE CURRENT (see Fig. 2) I_{PP}	MAXIMUM STANDBY CURRENT I_D @ V_{WM}
Gull-Wing	J-Bend	V	V	mA	V	A	µA
MSMBG5.0A	MSMBJ5.0A	5	6.40 – 7.00	10	9.2	65.2	800
MSMBG6.0A	MSMBJ6.0A	6	6.67 – 7.37	10	10.3	58.3	800
MSMBG6.5A	MSMBJ6.5A	6.5	7.22 – 7.98	10	11.2	53.6	500
MSMBG7.0A	MSMBJ7.0A	7	7.78 – 8.60	10	12	50	200
MSMBG7.5A	MSMBJ7.5A	7.5	8.33 – 9.21	1	12.9	46.5	100
MSMBG8.0A	MSMBJ8.0A	8	8.89 – 9.83	1	13.6	44.1	50
MSMBG8.5A	MSMBJ8.5A	8.5	9.44 – 10.4	1	14.4	41.7	10
MSMBG9.0A	MSMBJ9.0A	9	10.0 – 11.1	1	15.4	39	5
MSMBG10A	MSMBJ10A	10	11.1 – 12.3	1	17	35.3	5
MSMBG11A	MSMBJ11A	11	12.2 – 13.5	1	18.2	33	5
MSMBG12A	MSMBJ12A	12	13.3 – 14.7	1	19.9	30.2	5
MSMBG13A	MSMBJ13A	13	14.4 – 15.9	1	21.5	27.9	1
MSMBG14A	MSMBJ14A	14	15.6 – 17.2	1	23.2	25.8	1
MSMBG15A	MSMBJ15A	15	16.7 – 18.5	1	24.4	24	1
MSMBG16A	MSMBJ16A	16	17.8 – 19.7	1	26	23.1	1
MSMBG17A	MSMBJ17A	17	18.9 – 20.9	1	27.6	21.7	1
MSMBG18A	MSMBJ18A	18	20.0 – 22.1	1	29.2	20.5	1
MSMBG20A	MSMBJ20A	20	22.2 – 24.5	1	32.4	18.5	1
MSMBG22A	MSMBJ22A	22	24.4 – 26.9	1	35.5	16.9	1
MSMBG24A	MSMBJ24A	24	26.7 – 29.5	1	38.9	15.4	1
MSMBG26A	MSMBJ26A	26	28.9 – 31.9	1	42.1	14.2	1
MSMBG28A	MSMBJ28A	28	31.1 – 34.4	1	45.4	13.2	1
MSMBG30A	MSMBJ30A	30	33.3 – 36.8	1	48.4	12.4	1
MSMBG33A	MSMBJ33A	33	36.7 – 40.6	1	53.3	11.3	1
MSMBG36A	MSMBJ36A	36	40.0 – 44.2	1	58.1	10.3	1
MSMBG40A	MSMBJ40A	40	44.4 – 49.1	1	64.5	9.3	1
MSMBG43A	MSMBJ43A	43	47.8 – 52.8	1	69.4	8.6	1
MSMBG45A	MSMBJ45A	45	50.0 – 55.3	1	72.7	8.3	1
MSMBG48A	MSMBJ48A	48	53.3 – 58.9	1	77.4	7.7	1
MSMBG51A	MSMBJ51A	51	56.7 – 62.7	1	82.4	7.3	1
MSMBG54A	MSMBJ54A	54	60.0 – 66.3	1	87.1	6.9	1
MSMBG58A	MSMBJ58A	58	64.4 – 71.2	1	93.6	6.4	1
MSMBG60A	MSMBJ60A	60	66.7 – 73.7	1	96.8	6.2	1
MSMBG64A	MSMBJ64A	64	71.1 – 78.6	1	103	5.8	1
MSMBG70A	MSMBJ70A	70	77.8 – 86.0	1	113	5.3	1
MSMBG75A	MSMBJ75A	75	83.3 – 92.1	1	121	4.9	1
MSMBG78A	MSMBJ78A	78	86.7 – 95.8	1	126	4.7	1
MSMBG85A	MSMBJ85A	85	94.4 – 104	1	137	4.4	1
MSMBG90A	MSMBJ90A	90	100 – 111	1	146	4.1	1
MSMBG100A	MSMBJ100A	100	111 – 123	1	162	3.7	1
MSMBG110A	MSMBJ110A	110	122 – 135	1	177	3.4	1
MSMBG120A	MSMBJ120A	120	133 – 147	1	193	3.1	1
MSMBG130A	MSMBJ130A	130	144 – 159	1	209	2.9	1
MSMBG150A	MSMBJ150A	150	167 – 185	1	243	2.5	1
MSMBG160A	MSMBJ160A	160	178 – 197	1	259	2.3	1
MSMBG170A	MSMBJ170A	170	189 – 209	1	275	2.2	1

©2013 Microsemi Corporation

GRAPHS

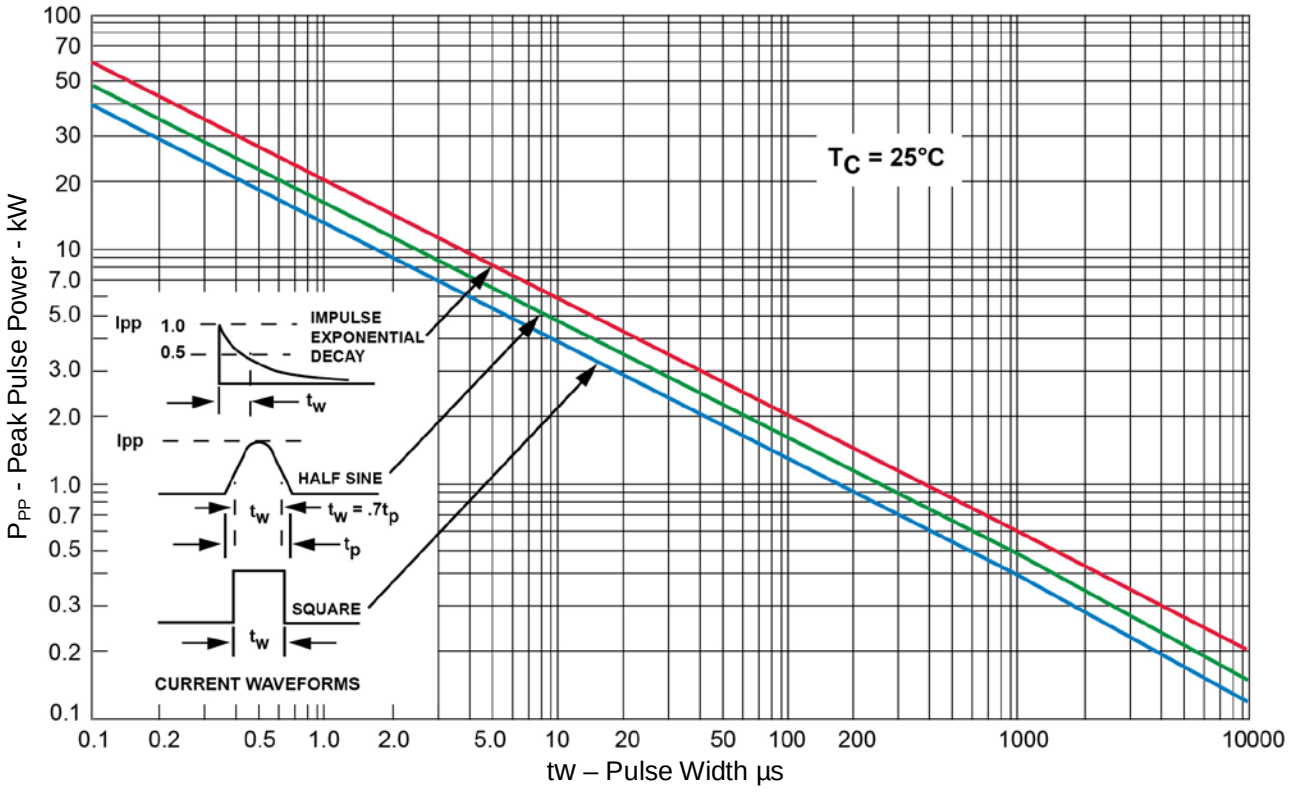
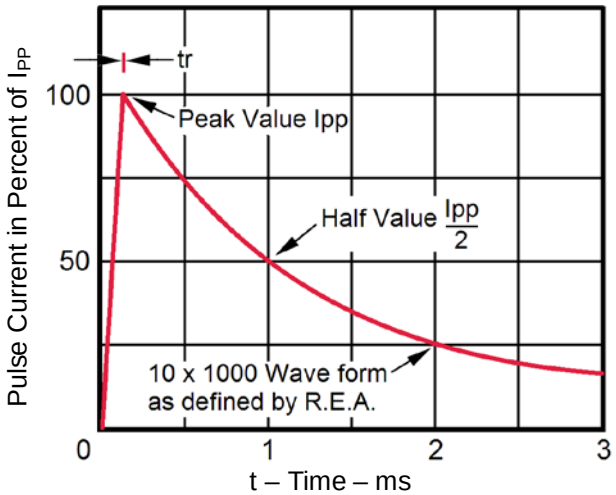


FIGURE 1
Peak Pulse Power vs Pulse Time



Test waveform parameters: tr=10 µs, tp=1000µs

FIGURE 2
Pulse Waveform for 10/1000 Exponential Surge

©2013 Microsemi Corporation

GRAPHS (continued)

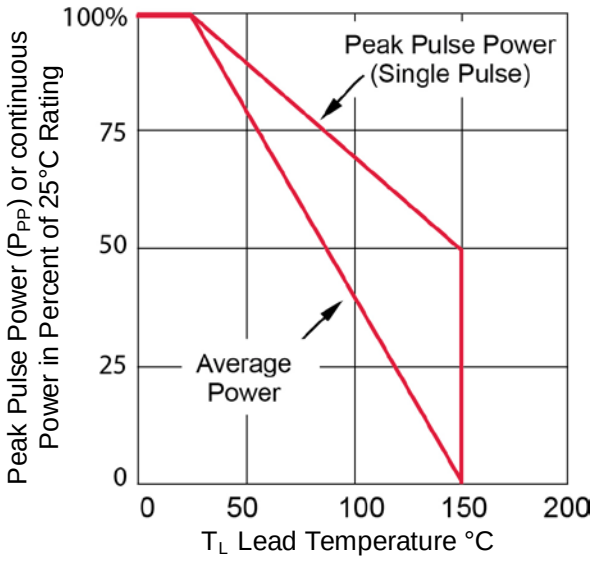


FIGURE 3
Derating Curve

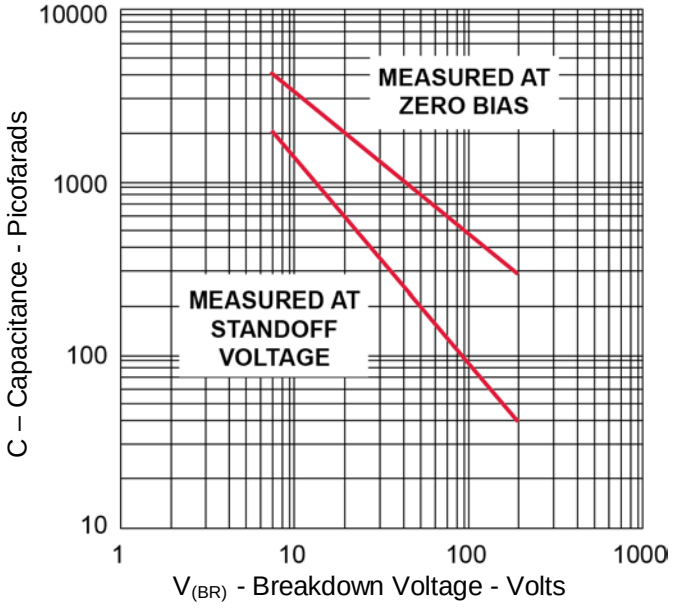
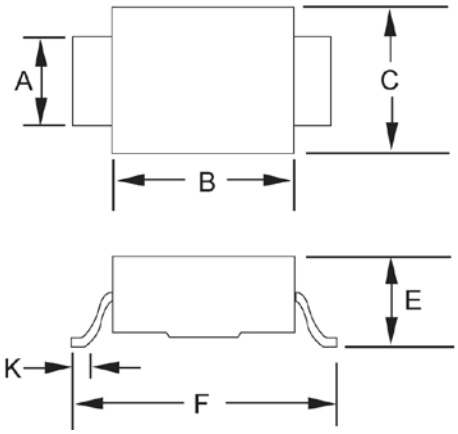


FIGURE 4
Typical Capacitance vs. Breakdown Voltage
NOTE: Bidirectional capacitance is half that shown at zero volts.

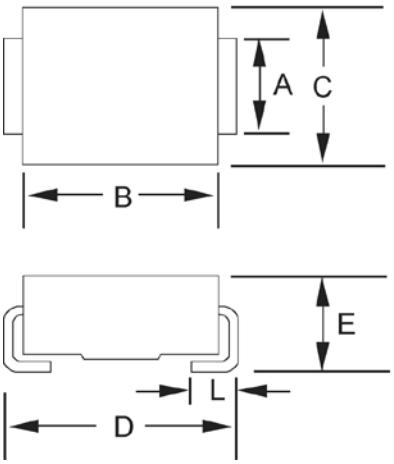
©2013 Microsemi Corporation

PACKAGE DIMENSIONS



SMBG (DO-215AA)

Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	.077	.083	1.96	2.10
B	.160	.180	4.06	4.57
C	.130	.155	3.30	3.94
E	.077	.104	1.95	2.65
F	.235	.255	5.97	6.48
K	.015	.030	.381	.762



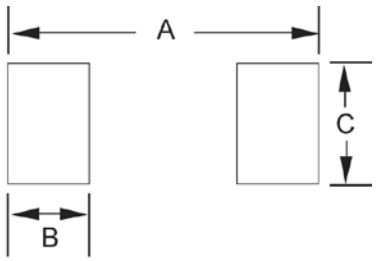
SMBJ (DO-214AA)

Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	.077	.083	1.96	2.10
B	.160	.180	4.06	4.57
C	.130	.155	3.30	3.94
D	.205	.220	5.21	5.59
E	.077	.104	1.95	2.65
L	.030	.060	.760	1.52

See pad layout on next page.

©2013 Microsemi Corporation

PAD LAYOUT



SMBG (DO-215AA)		
Ltr	**Inch**	**Millimeters**
A	0.320	8.13
B	0.085	2.16
C	0.110	2.79

SMBJ (DO-214AA)		
Ltr	**Inch**	**Millimeters**
A	0.260	6.60
B	0.085	2.16
C	0.110	2.79

©2013 Microsemi Corporation

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Microsemi:

MXSMBG15Ae3 MXSMBG8.0CAe3 MSMBG6.5A MASMBJ16CA MASMBG12Ae3 MXSMBG11A MSMBJ11CAe3 MASMBG28Ae3 MXLSMBJ28CA MSMBJ64CA MXSMBG58A MXSMBG24A MSMBJ36A MXSMBJ58A MASMBJ43CAe3 MXSMBG60A MSMBG26CA MXSMBG170Ae3 MXSMBJ160CA MSMBG12A MASMBJ110CAe3 MSMBG11CAe3 MXSMBJ40CA MXSMBG10CAe3 MXLSMBG13A MXSMBG14Ae3 MXSMBJ58CA MASMBG9.0CAe3 MXLSMBJ75CAe3 MASMBG17CA MXLSMBJ48CAe3 MXSMBJ15CAe3 MXSMBJ70CA MXLSMBG48CA MXLSMBJ110Ae3 MXLSMBG90CA MXSMBG7.0CA MXSMBG13Ae3 MXSMBJ160CAe3 MSMBG120CA MSMBG70CA MASMBG20CA MASMBJ90CA MSMBJ28A MASMBJ33CAe3 MXSMBJ43Ae3 MXLSMBJ18CAe3 MASMBJ24CA MXLSMBJ8.0A MSMBG5.0CA MXLSMBG8.5CA MXLSMBJ33CAe3 MXLSMBJ12CAe3 MXLSMBG16Ae3 MXLSMBJ12CA MSMBJ14CA MASMBJ11A MSMBJ26CAe3 MXSMBJ170CA MSMBG20Ae3 MXSMBG6.5CA MASMBG36Ae3 MSMBJ16CAe3 MSMBG160A MSMBJ24CAe3 MSMBJ45CA MASMBJ130Ae3 MXLSMBG22A MXSMBJ9.0CAe3 MSMBJ100Ae3 MSMBJ30Ae3 MXLSMBG28CA MXSMBG58CA MASMBJ60CAe3 MSMBG170A MXSMBG16CAe3 MXSMBG170CAe3 MASMBG7.5Ae3 MXLSMBJ170A MXLSMBJ78CAe3 MXSMBJ18A MASMBJ22CAe3 MASMBG45CAe3 MSMBG100Ae3 MXSMBJ13A MXLSMBJ6.0CAe3 MASMBJ8.5CA MASMBJ85CA MSMBJ7.5CAe3 MASMBJ9.0CA MXLSMBG12Ae3 MXLSMBG7.0CA MSMBG13Ae3 MXSMBG22CAe3 MXSMBG18CAe3 MXLSMBG170CA MSMBG9.0Ae3 MXLSMBG17CAe3 MASMBG7.0CA MASMBG8.5A