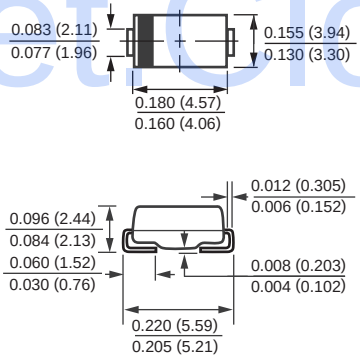
RECTRON
SEMICONDUCTOR
TECHNICAL SPECIFICATION

**TVS**
**TFMBJ**
**SERIES**

# *SURFACE MOUNT GPP*
# *GPP TRANSIENT VOLTAGE SUPPRESSOR*
## *600 WATT PEAK POWER 5.0 WATTS STEADY STATE*

**FEATURES**
* Plastic package has underwriters laboratory
* Glass passivated chip construction
* 600 watt surage capability at 1ms
* Excellent clamping capability
* Low zener impedance
* Fast response time

**DO-214AA**




Dimensions in inches and (millimeters)

Datasheet.Cloud

Ratings at 25 °C ambient temperature unless otherwise specified.

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**
Ratings at 25 °C ambient temperature unless otherwise specified.

## DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA suffix for types TFMBJ5.0 thru TFMBJ170

Electrical characteristics apply in both direction

**MAXIMUM RATINGS** (At $T_A$ = 25°C unless otherwise noted)

| RATINGS | SYMBOL | VALUE | UNITS |
|---|---|---|---|
| Peak Power Dissipation with a 10/1000uS (Note 1,2, Fig.1) | $P_{PPM}$ | Minimum 600 | Watts |
| Peak Pulse Current with a 10/1000uS waveform ( Note 1, Fig.3 ) | $I_{PPM}$ | SEE TABLE 1 | Amps |
| Steady State Power Dissipation at $T_L$ = 75°C (Note 2) | $P_M(AV)$ | 5.0 | Watts |
| Peak Forward Surge Current 8.3mS single half sine-wave superimposed on rated load (JEDEC method) (Note 2,3) unidirectional only | $I_{FSM}$ | 100 | Amps |
| Maximum Instantaneous Forward Voltage at 50A for unidirectional only (Note 3,4) | $V_F$ | SEE NOTE 4 | Volts |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to + 150 | °C |

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NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A$ = 25°C per Fig.2.
2. Mounted on 0.2 X 0.2"( 5.0 X 5.0mm ) copper pad to each terminal.
3. Lead temperature at $T_L$ = 25°C
4. Measured on 8.3mS single half sine-wave duty cycle = 4 pules per minute maximum.
5. $V_F$ = 3.5V on TFMBJ-5.0 thru TFMBJ-90 devices and $V_F$ = 5.0V on TFMBJ-100 thru TFMBJ-170 devices.

# RATING AND CHARACTERISTIC CURVES ( TFMBJ5.0 THRU TFMBJ170CA )

FIG. 1 - PEAK PULSE POWER RATING CURVE

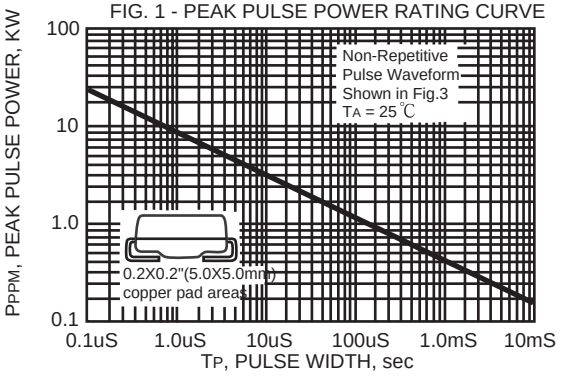



FIG. 2 - PULSE DERATING CURVE

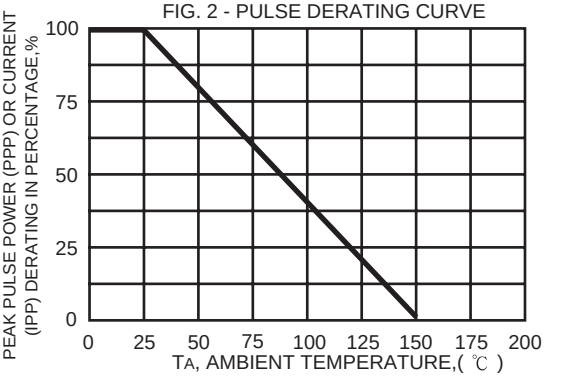



FIG. 3 - PULSE WAVEFORM

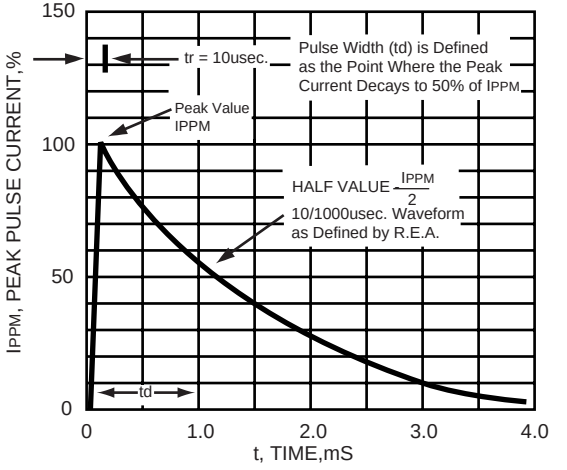



FIG. 4 - TYPICAL JUNCTION CAPACITANCE

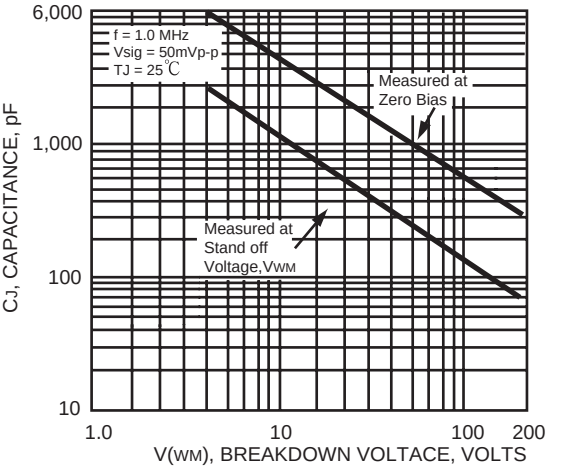



FIG. 5 - TYPICAL JUNCTION CAPACITANCE BIDIRECTIONAL

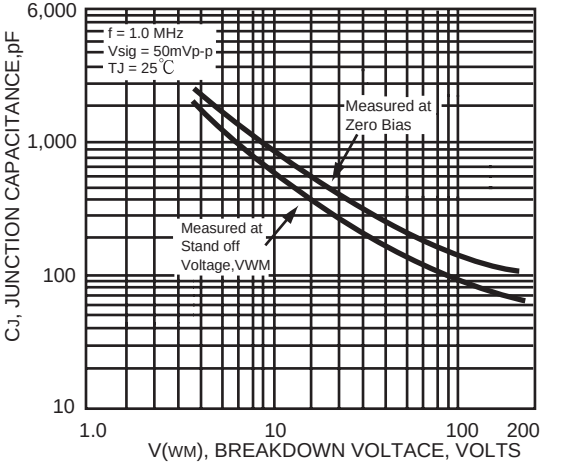
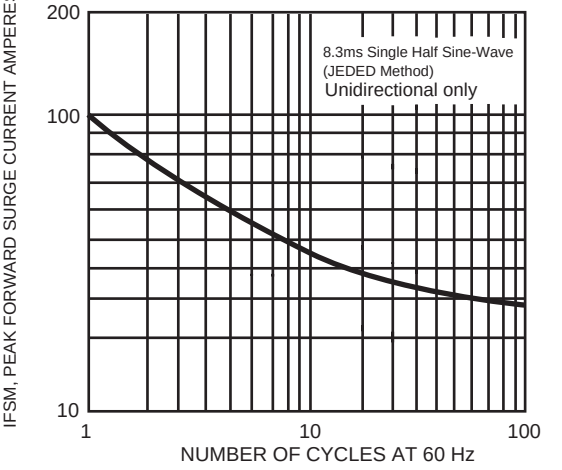



FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL



# TRANSIENT VOLTAGE SUPPRESSORS

600W SERIES TVS DIODES / DO-214AA ( CASE 3 ) 600W

| Rectron Industry No. | Rectron House No. | Breakdown Voltage | | | Reverse Stand off Voltage $V_{WM}$ (Volts) | Maximum Reverse Leakage at $V_{WM}$ $I_D$(uA) | Maximum Peak Pulse Current $I_{PPM}$ (Amps) | Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts) |
|---|---|---|---|---|---|---|---|---|
| | | $V_{BR}$ (Volts) | | @IT | | | | |
| | | MIN. | MAX. | (mA) | | | | |
| SMBJ5.0 | TFMBJ5.0 | 6.40 | 7.82 | 10 | 5.0 | 800.0 | 62.5 | 9.6 |
| SMBJ5.0A | TFMBJ5.0A | 6.40 | 7.07 | 10 | 5.0 | 800.0 | 65.2 | 9.2 |
| SMBJ6.0 | TFMBJ6.0 | 6.67 | 8.15 | 10 | 6.0 | 800.0 | 52.6 | 11.4 |
| SMBJ6.0A | TFMBJ6.0A | 6.67 | 7.37 | 10 | 6.0 | 800.0 | 58.3 | 10.3 |
| SMBJ6.5 | TFMBJ6.5 | 7.22 | 8.82 | 10 | 6.5 | 500.0 | 48.8 | 12.3 |
| SMBJ6.5A | TFMBJ6.5A | 7.22 | 7.98 | 10 | 6.5 | 500.0 | 53.6 | 11.2 |
| SMBJ7.0 | TFMBJ7.0 | 7.78 | 9.51 | 10 | 7.0 | 200.0 | 45.1 | 13.3 |
| SMBJ7.0A | TFMBJ7.0A | 7.78 | 8.60 | 10 | 7.0 | 200.0 | 50.0 | 12.0 |
| SMBJ7.5 | TFMBJ7.5 | 8.33 | 10.2 | 1.0 | 7.5 | 100.0 | 42.0 | 14.3 |
| SMBJ7.5A | TFMBJ7.5A | 8.33 | 9.21 | 1.0 | 7.5 | 100.0 | 46.5 | 12.9 |
| SMBJ8.0 | TFMBJ8.0 | 8.89 | 10.9 | 1.0 | 8.0 | 50.0 | 40.0 | 15.0 |
| SMBJ8.0A | TFMBJ8.0A | 8.89 | 9.83 | 1.0 | 8.0 | 50.0 | 44.1 | 13.6 |
| SMBJ8.5 | TFMBJ8.5 | 9.44 | 11.5 | 1.0 | 8.5 | 20.0 | 37.7 | 15.9 |
| SMBJ8.5A | TFMBJ8.5A | 9.44 | 10.4 | 1.0 | 8.5 | 20.0 | 41.7 | 14.4 |
| SMBJ9.0 | TFMBJ9.0 | 10.0 | 12.2 | 1.0 | 9.0 | 10.0 | 35.5 | 16.9 |
| SMBJ9.0A | TFMBJ9.0A | 10.0 | 11.1 | 1.0 | 9.0 | 10.0 | 39.0 | 15.4 |
| SMBJ10 | TFMBJ10 | 11.1 | 13.6 | 1.0 | 10.0 | 5.0 | 31.9 | 18.8 |
| SMBJ10A | TFMBJ10A | 11.1 | 12.3 | 1.0 | 10.0 | 5.0 | 35.3 | 17.0 |
| SMBJ11 | TFMBJ11 | 12.2 | 14.9 | 1.0 | 11.0 | 5.0 | 29.9 | 20.1 |
| SMBJ11A | TFMBJ11A | 12.2 | 13.5 | 1.0 | 11.0 | 5.0 | 33.0 | 18.2 |
| SMBJ12 | TFMBJ12 | 13.3 | 16.3 | 1.0 | 12.0 | 5.0 | 27.3 | 22.0 |
| SMBJ12A | TFMBJ12A | 13.3 | 14.7 | 1.0 | 12.0 | 5.0 | 30.2 | 19.9 |
| SMBJ13 | TFMBJ13 | 14.4 | 17.6 | 1.0 | 13.0 | 5.0 | 25.2 | 23.8 |
| SMBJ13A | TFMBJ13A | 14.4 | 15.9 | 1.0 | 13.0 | 5.0 | 27.9 | 21.5 |
| SMBJ14 | TFMBJ14 | 15.6 | 19.1 | 1.0 | 14.0 | 5.0 | 23.3 | 25.8 |
| SMBJ14A | TFMBJ14A | 15.6 | 17.2 | 1.0 | 14.0 | 5.0 | 25.9 | 23.2 |
| SMBJ15 | TFMBJ15 | 16.7 | 20.4 | 1.0 | 15.0 | 5.0 | 22.3 | 26.9 |
| SMBJ15A | TFMBJ15A | 16.7 | 18.5 | 1.0 | 15.0 | 5.0 | 24.6 | 24.4 |
| SMBJ16 | TFMBJ16 | 17.8 | 21.8 | 1.0 | 16.0 | 5.0 | 20.8 | 28.8 |
| SMBJ16A | TFMBJ16A | 17.8 | 19.7 | 1.0 | 16.0 | 5.0 | 23.1 | 26.0 |
| SMBJ17 | TFMBJ17 | 18.9 | 23.1 | 1.0 | 17.0 | 5.0 | 19.7 | 30.5 |
| SMBJ17A | TFMBJ17A | 18.9 | 20.9 | 1.0 | 17.0 | 5.0 | 21.7 | 27.6 |
| SMBJ18 | TFMBJ18 | 20.0 | 24.4 | 1.0 | 18.0 | 5.0 | 18.6 | 32.2 |
| SMBJ18A | TFMBJ18A | 20.0 | 22.1 | 1.0 | 18.0 | 5.0 | 20.5 | 29.2 |
| SMBJ20 | TFMBJ20 | 22.2 | 27.1 | 1.0 | 20.0 | 5.0 | 16.8 | 35.8 |
| SMBJ20A | TFMBJ20A | 22.2 | 24.5 | 1.0 | 20.0 | 5.0 | 18.5 | 32.4 |
| SMBJ22 | TFMBJ22 | 24.4 | 29.8 | 1.0 | 22.0 | 5.0 | 15.2 | 39.4 |
| SMBJ22A | TFMBJ22A | 24.4 | 26.9 | 1.0 | 22.0 | 5.0 | 16.9 | 35.5 |
| SMBJ24 | TFMBJ24 | 26.7 | 32.6 | 1.0 | 24.0 | 5.0 | 14.0 | 43.0 |
| SMBJ24A | TFMBJ24A | 26.7 | 29.5 | 1.0 | 24.0 | 5.0 | 15.4 | 38.9 |
| SMBJ26 | TFMBJ26 | 28.9 | 35.3 | 1.0 | 26.0 | 5.0 | 12.9 | 46.6 |
| SMBJ26A | TFMBJ26A | 28.9 | 31.9 | 1.0 | 26.0 | 5.0 | 14.3 | 42.1 |
| SMBJ28 | TFMBJ28 | 31.1 | 38.0 | 1.0 | 28.0 | 5.0 | 12.0 | 50.0 |
| SMBJ28A | TFMBJ28A | 31.1 | 34.4 | 1.0 | 28.0 | 5.0 | 13.2 | 45.4 |
| SMBJ30 | TFMBJ30 | 33.3 | 40.7 | 1.0 | 30.0 | 5.0 | 11.2 | 53.5 |
| SMBJ30A | TFMBJ30A | 33.3 | 36.8 | 1.0 | 30.0 | 5.0 | 12.4 | 48.4 |
| SMBJ33 | TFMBJ33 | 36.7 | 44.9 | 1.0 | 33.0 | 5.0 | 10.2 | 59.0 |
| SMBJ33A | TFMBJ33A | 36.7 | 40.6 | 1.0 | 33.0 | 5.0 | 11.3 | 53.3 |
| SMBJ36 | TFMBJ36 | 40.0 | 48.9 | 1.0 | 36.0 | 5.0 | 9.3 | 64.3 |
| SMBJ36A | TFMBJ36A | 40.0 | 44.2 | 1.0 | 36.0 | 5.0 | 10.3 | 58.1 |

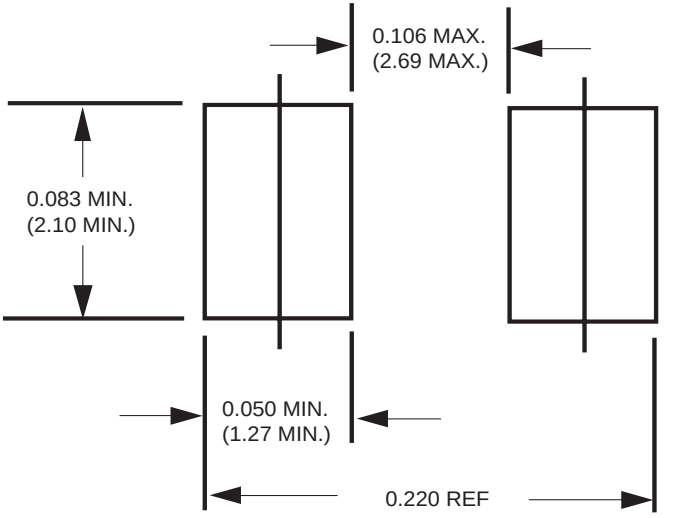
# TRANSIENT VOLTAGE SUPPRESSORS

## 600W SERIES TVS DIODES / DO-214AA ( CASE 3 ) 600W

| Rectron Industry No. | Rectron House No. | Breakdown Voltage $V_{BR}$ (Volts) | | @$I_T$ | Reverse Stand off Voltage $V_{WM}$ (Volts) | Maximum Reverse Leakage at $V_{WM}$ $I_D$(uA) | Maximum Peak Pulse Current $I_{PPM}$ (Amps) | Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts) |
|---|---|---|---|---|---|---|---|---|
| | | MIN. | MAX. | (mA) | | | | |
| SMBJ40 | TFMBJ40 | 44.4 | 54.3 | 1.0 | 40 | 5.0 | 8.4 | 71.4 |
| SMBJ40A | TFMBJ40A | 44.4 | 49.1 | 1.0 | 40 | 5.0 | 9.3 | 64.5 |
| SMBJ43 | TFMBJ43 | 47.8 | 58.4 | 1.0 | 43 | 5.0 | 7.8 | 76.7 |
| SMBJ43A | TFMBJ43A | 47.8 | 52.8 | 1.0 | 43 | 5.0 | 8.6 | 69.4 |
| SMBJ45 | TFMBJ45 | 50.0 | 61.1 | 1.0 | 45 | 5.0 | 7.5 | 80.3 |
| SMBJ45A | TFMBJ45A | 50.0 | 55.3 | 1.0 | 45 | 5.0 | 8.3 | 72.7 |
| SMBJ48 | TFMBJ48 | 53.3 | 65.1 | 1.0 | 48 | 5.0 | 7.0 | 85.5 |
| SMBJ48A | TFMBJ48A | 53.3 | 58.9 | 1.0 | 48 | 5.0 | 7.8 | 77.4 |
| SMBJ51 | TFMBJ51 | 56.7 | 69.3 | 1.0 | 51 | 5.0 | 6.6 | 91.1 |
| SMBJ51A | TFMBJ51A | 56.7 | 62.7 | 1.0 | 51 | 5.0 | 7.3 | 82.4 |
| SMBJ54 | TFMBJ54 | 60.0 | 73.3 | 1.0 | 54 | 5.0 | 6.2 | 96.3 |
| SMBJ54A | TFMBJ54A | 60.0 | 66.3 | 1.0 | 54 | 5.0 | 6.9 | 87.1 |
| SMBJ58 | TFMBJ58 | 64.4 | 78.7 | 1.0 | 58 | 5.0 | 5.8 | 103 |
| SMBJ58A | TFMBJ58A | 64.4 | 71.2 | 1.0 | 58 | 5.0 | 6.4 | 93.6 |
| SMBJ60 | TFMBJ60 | 66.7 | 81.5 | 1.0 | 60 | 5.0 | 5.6 | 107 |
| SMBJ60A | TFMBJ60A | 66.7 | 73.7 | 1.0 | 60 | 5.0 | 6.2 | 96.8 |
| SMBJ64 | TFMBJ64 | 71.1 | 86.9 | 1.0 | 64 | 5.0 | 5.3 | 114 |
| SMBJ64A | TFMBJ64A | 71.1 | 78.6 | 1.0 | 64 | 5.0 | 5.8 | 103 |
| SMBJ70 | TFMBJ70 | 77.8 | 95.1 | 1.0 | 70 | 5.0 | 4.8 | 125 |
| SMBJ70A | TFMBJ70A | 77.8 | 86.0 | 1.0 | 70 | 5.0 | 5.3 | 113 |
| SMBJ75 | TFMBJ75 | 83.3 | 102 | 1.0 | 75 | 5.0 | 4.5 | 134 |
| SMBJ75A | TFMBJ75A | 83.3 | 92.1 | 1.0 | 75 | 5.0 | 5.0 | 121 |
| SMBJ78 | TFMBJ78 | 86.7 | 106 | 1.0 | 78 | 5.0 | 4.3 | 139 |
| SMBJ78A | TFMBJ78A | 86.7 | 95.8 | 1.0 | 78 | 5.0 | 4.8 | 126 |
| SMBJ85 | TFMBJ85 | 94.4 | 115 | 1.0 | 85 | 5.0 | 4.0 | 151 |
| SMBJ85A | TFMBJ85A | 94.4 | 104 | 1.0 | 85 | 5.0 | 4.4 | 137 |
| SMBJ90 | TFMBJ90 | 100 | 122 | 1.0 | 90 | 5.0 | 3.8 | 160 |
| SMBJ90A | TFMBJ90A | 100 | 111 | 1.0 | 90 | 5.0 | 4.1 | 146 |
| SMBJ100 | TFMBJ100 | 111 | 136 | 1.0 | 100 | 5.0 | 3.4 | 179 |
| SMBJ100A | TFMBJ100A | 111 | 123 | 1.0 | 100 | 5.0 | 3.7 | 162 |
| SMBJ110 | TFMBJ110 | 122 | 149 | 1.0 | 110 | 5.0 | 3.1 | 196 |
| SMBJ110A | TFMBJ110A | 122 | 135 | 1.0 | 110 | 5.0 | 3.4 | 177 |
| SMBJ120 | TFMBJ120 | 133 | 163 | 1.0 | 120 | 5.0 | 2.8 | 214 |
| SMBJ120A | TFMBJ120A | 133 | 147 | 1.0 | 120 | 5.0 | 3.1 | 193 |
| SMBJ130 | TFMBJ130 | 144 | 176 | 1.0 | 130 | 5.0 | 2.6 | 231 |
| SMBJ130A | TFMBJ130A | 144 | 159 | 1.0 | 130 | 5.0 | 2.9 | 209 |
| SMBJ150 | TFMBJ150 | 167 | 204 | 1.0 | 150 | 5.0 | 2.2 | 268 |
| SMBJ150A | TFMBJ150A | 167 | 185 | 1.0 | 150 | 5.0 | 2.5 | 243 |
| SMBJ160 | TFMBJ160 | 178 | 218 | 1.0 | 160 | 5.0 | 2.1 | 287 |
| SMBJ160A | TFMBJ160A | 178 | 197 | 1.0 | 160 | 5.0 | 2.3 | 259 |
| SMBJ170 | TFMBJ170 | 189 | 231 | 1.0 | 170 | 5.0 | 2.0 | 304 |
| SMBJ170A | TFMBJ170A | 189 | 209 | 1.0 | 170 | 5.0 | 2.2 | 275 |

Notes :
1. $V_{BR}$ measured after $I_T$ applied for 300ms. $I_T$ = square pulse or equivalent.
2. For bidirectional use C or CA suffixs for all types (ex. SMBJ5.0C,SMBJ170CA) electrical characteristics apply in both directions.
3. For bidirectional types having $V_{WM}$ of 10 volts and less, the $I_D$ limit is doubled.
4. All devices UL listed file# E211196.

## *Mounting Pad Layout*




Dimensions in inches and (millimeters)