

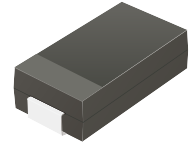
## SMAJ5.0(C)A-HF Thru. SMAJ440(C)A-HF

Working Peak Reverse Voltage: 5.0 to 440 Volts

Power Dissipation: 400 Watts

RoHS Device

Halogen Free

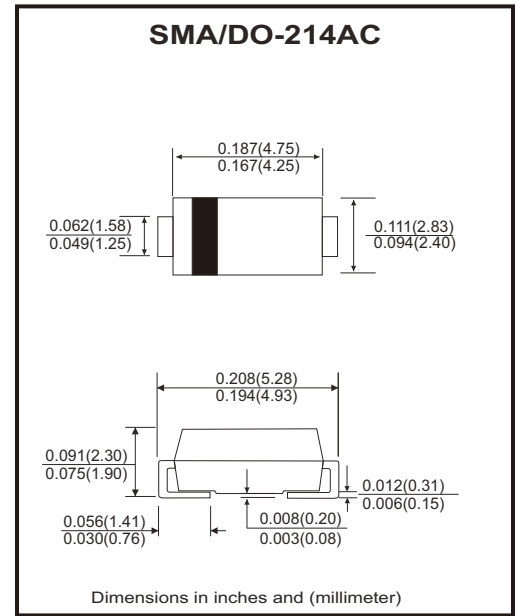


### Features

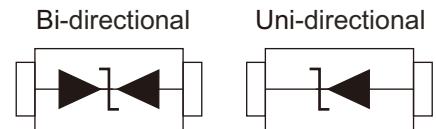
- 400W peak pulse power capability with a 10/1000 $\mu$ s waveform, repetitive rate (duty cycle):0.01%
- For surface mounted applications to optimize board space
- Low incremental surge impedance
- Excellent clamping capability
- Very fast response time
- Uni and Bidirectional unit
- Plastic package has underwriters laboratory flammability 94V-0
- Meet Halogen free and RoHS compliant

### Mechanical data

- Case: SMA/DO-214AC, molded plastic.
- Terminals: solderable per MIL-STD-750, method 2026.
- Polarity: Color band denotes positive end (cathode) bi-directional models



### Circuit Diagram



### Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.  
Single phase, half wave, 60Hz resistive or inductive load. For capacitive load, derate current by 20%.

| Characteristics   | Symbol                            | Value          | Units |
|---|-----------------------------------|----------------|-------|
| Peak power dissipation on a 10/1000 $\mu$ s waveform (Note 1)                         | P <sub>PP</sub>                   | 400            | W     |
| Peak pulse current on a 10/1000 $\mu$ s waveform (Note 1)                             | I <sub>PP</sub>                   | See Next Table | A     |
| Steady state power dissipation at T <sub>L</sub> =50°C                                | P <sub>D</sub>                    | 1.0            | W     |
| Peak forward surge current, 8.3ms single half sine-wave uni-directional only (Note 2) | I <sub>FSM</sub>                  | 40             | A     |
| Maximum instantaneous forward voltage at 25 A for uni-directional only                | V <sub>F</sub>                    | 3.5/5.0        | V     |
| Operation junction and storage temperature range                                      | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150    | °C    |

- Notes: 1. Non-repetitive current pulse, and derated above T<sub>A</sub>=25°C  
2. Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal  
3. V<sub>F</sub><3.5V for devices of V<sub>BR</sub><200V and V<sub>F</sub><5.0V for devices of V<sub>BR</sub>>201V

## Electrical Characteristics (at TA=25°C, unless otherwise specified)

| Part No.       | Breakdown voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |          |                     | Maximum Reverse Leakage<br>@V <sub>RWM</sub><br>I <sub>R</sub> (μA) | Working Peak Reverse Voltage<br>V <sub>RWM</sub> (V) | Maximum Reverse Surge Current<br>I <sub>PP</sub> (A) | Maximum Clamping Voltage<br>@I <sub>PP</sub><br>V <sub>C</sub> (V) | Marking Code |    |
|----------------|---|----------|---------------------|---|--|--|--|--------------|----|
|                | Min. (V)  | Max. (V) | I <sub>T</sub> (mA) |   |  |  |  | UNI          | BI |
| SMAJ5.0(C)A-HF | 6.40  | 7.25     | 10                  | 800   | 5.0  | 43.5   | 9.2  | AE           | WE |
| SMAJ6.0(C)A-HF | 6.67  | 7.37     | 10                  | 800   | 6.0  | 38.8   | 10.3   | AG           | WG |
| SMAJ6.5(C)A-HF | 7.22  | 7.98     | 10                  | 500   | 6.5  | 35.7   | 11.2   | AK           | WK |
| SMAJ7.0(C)A-HF | 7.78  | 8.60     | 10                  | 200   | 7.0  | 33.3   | 12.0   | AM           | WM |
| SMAJ7.5(C)A-HF | 8.33  | 9.21     | 1                   | 100   | 7.5  | 31.0   | 12.9   | AP           | WP |
| SMAJ8.0(C)A-HF | 8.89  | 9.83     | 1                   | 50  | 8.0  | 29.4   | 13.6   | AR           | WR |
| SMAJ8.5(C)A-HF | 9.44  | 10.40    | 1                   | 10  | 8.5  | 27.8   | 14.4   | AT           | WT |
| SMAJ9.0(C)A-HF | 10.00   | 11.10    | 1                   | 5   | 9.0  | 26.0   | 15.4   | AV           | WV |
| SMAJ10(C)A-HF  | 11.10   | 12.30    | 1                   | 5   | 10.0   | 23.5   | 17.0   | AX           | WX |
| SMAJ11(C)A-HF  | 12.20   | 13.50    | 1                   | 5   | 11.0   | 22.0   | 18.2   | AZ           | WZ |
| SMAJ12(C)A-HF  | 13.30   | 14.70    | 1                   | 5   | 12.0   | 20.1   | 19.9   | BE           | XE |
| SMAJ13(C)A-HF  | 14.40   | 15.90    | 1                   | 5   | 13.0   | 18.6   | 21.5   | BG           | XG |
| SMAJ14(C)A-HF  | 15.60   | 17.20    | 1                   | 5   | 14.0   | 17.2   | 23.2   | BK           | XK |
| SMAJ15(C)A-HF  | 16.70   | 18.50    | 1                   | 5   | 15.0   | 16.4   | 24.4   | BM           | XM |
| SMAJ16(C)A-HF  | 17.80   | 19.70    | 1                   | 5   | 16.0   | 15.4   | 26.0   | BP           | XP |
| SMAJ17(C)A-HF  | 18.90   | 20.90    | 1                   | 5   | 17.0   | 14.5   | 27.6   | BR           | XR |
| SMAJ18(C)A-HF  | 20.00   | 22.10    | 1                   | 5   | 18.0   | 13.7   | 29.2   | BT           | XT |
| SMAJ20(C)A-HF  | 22.20   | 24.50    | 1                   | 5   | 20.0   | 12.3   | 32.4   | BV           | XV |
| SMAJ22(C)A-HF  | 24.40   | 26.90    | 1                   | 5   | 22.0   | 11.3   | 35.5   | BX           | XX |
| SMAJ24(C)A-HF  | 26.70   | 29.50    | 1                   | 5   | 24.0   | 10.3   | 38.9   | BZ           | XZ |
| SMAJ26(C)A-HF  | 28.90   | 31.90    | 1                   | 5   | 26.0   | 9.5  | 42.1   | CE           | YE |
| SMAJ28(C)A-HF  | 31.10   | 34.40    | 1                   | 5   | 28.0   | 8.8  | 45.4   | CG           | YG |
| SMAJ30(C)A-HF  | 33.30   | 36.80    | 1                   | 5   | 30.0   | 8.3  | 48.4   | CK           | YK |
| SMAJ33(C)A-HF  | 36.70   | 40.60    | 1                   | 5   | 33.0   | 7.5  | 53.3   | CM           | YM |
| SMAJ36(C)A-HF  | 40.00   | 44.20    | 1                   | 5   | 36.0   | 6.9  | 58.1   | CP           | YP |
| SMAJ40(C)A-HF  | 44.40   | 49.10    | 1                   | 5   | 40.0   | 6.2  | 64.5   | CR           | YR |
| SMAJ43(C)A-HF  | 47.80   | 52.80    | 1                   | 5   | 43.0   | 5.8  | 69.4   | CT           | YT |
| SMAJ45(C)A-HF  | 50.00   | 55.30    | 1                   | 5   | 45.0   | 5.5  | 72.7   | CV           | YV |
| SMAJ48(C)A-HF  | 53.30   | 58.90    | 1                   | 5   | 48.0   | 5.2  | 77.4   | CX           | YX |
| SMAJ51(C)A-HF  | 56.70   | 62.70    | 1                   | 5   | 51.0   | 4.9  | 82.4   | CZ           | YZ |
| SMAJ54(C)A-HF  | 60.00   | 66.30    | 1                   | 5   | 54.0   | 4.6  | 87.1   | RE           | ZE |
| SMAJ58(C)A-HF  | 64.40   | 71.20    | 1                   | 5   | 58.0   | 4.3  | 93.6   | RG           | ZG |
| SMAJ60(C)A-HF  | 66.70   | 73.70    | 1                   | 5   | 60.0   | 4.1  | 96.8   | RK           | ZK |
| SMAJ64(C)A-HF  | 71.10   | 78.60    | 1                   | 5   | 64.0   | 3.9  | 103.0  | RM           | ZM |
| SMAJ70(C)A-HF  | 77.80   | 86.00    | 1                   | 5   | 70.0   | 3.5  | 113.0  | RP           | ZP |
| SMAJ75(C)A-HF  | 83.30   | 92.10    | 1                   | 5   | 75.0   | 3.3  | 121.0  | RR           | ZR |
| SMAJ78(C)A-HF  | 86.70   | 95.80    | 1                   | 5   | 78.0   | 3.2  | 126.0  | RT           | ZT |
| SMAJ85(C)A-HF  | 94.40   | 104.00   | 1                   | 5   | 85.0   | 2.9  | 137.0  | RV           | ZV |
| SMAJ90(C)A-HF  | 100.00  | 111.00   | 1                   | 5   | 90.0   | 2.7  | 146.0  | RX           | ZX |
| SMAJ100(C)A-HF | 111.00  | 123.00   | 1                   | 5   | 100.0  | 2.4  | 162.0  | RZ           | ZZ |

## Electrical Characteristics (at TA=25°C, unless otherwise specified)

| Part No.       | Breakdown voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |             |                        | Maximum<br>Reverse<br>Leakage<br>@V <sub>RWM</sub><br>I <sub>R</sub> (μA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> (V) | Maximum<br>Reverse<br>Surge<br>Current<br>I <sub>PP</sub> (A) | Maximum<br>Clamping<br>Voltage<br>@I <sub>PP</sub><br>V <sub>C</sub> (V) | Marking<br>Code |    |
|----------------|---|-------------|------------------------|---|---|---|--|-----------------|----|
|                | Min.<br>(V)   | Max.<br>(V) | I <sub>T</sub><br>(mA) |   |   |   |  | UNI             | BI |
| SMAJ110(C)A-HF | 122.0   | 135.0       | 1                      | 5   | 110.0   | 2.2   | 177.0  | SE              | VE |
| SMAJ120(C)A-HF | 133.0   | 147.0       | 1                      | 5   | 120.0   | 2.1   | 193.0  | SG              | VG |
| SMAJ130(C)A-HF | 144.0   | 159.0       | 1                      | 5   | 130.0   | 1.9   | 209.0  | SK              | VK |
| SMAJ150(C)A-HF | 167.0   | 185.0       | 1                      | 5   | 150.0   | 1.6   | 243.0  | SM              | VM |
| SMAJ160(C)A-HF | 178.0   | 197.0       | 1                      | 5   | 160.0   | 1.5   | 259.0  | SP              | VP |
| SMAJ170(C)A-HF | 189.0   | 209.0       | 1                      | 5   | 170.0   | 1.4   | 275.0  | SR              | VR |
| SMAJ180(C)A-HF | 200.0   | 220.0       | 1                      | 5   | 180.0   | 1.3   | 291.6  | ST              | VT |
| SMAJ200(C)A-HF | 224.0   | 247.0       | 1                      | 1   | 200.0   | 1.2   | 324.0  | SV              | VV |
| SMAJ220(C)A-HF | 246.0   | 272.0       | 1                      | 1   | 220.0   | 1.1   | 356.0  | SX              | VX |
| SMAJ250(C)A-HF | 279.0   | 309.0       | 1                      | 1   | 250.0   | 1.0   | 405.0  | SZ              | VZ |
| SMAJ300(C)A-HF | 335.0   | 371.0       | 1                      | 1   | 300.0   | 0.8   | 486.0  | TE              | UE |
| SMAJ350(C)A-HF | 391.0   | 432.0       | 1                      | 1   | 350.0   | 0.7   | 567.0  | TG              | UG |
| SMAJ400(C)A-HF | 447.0   | 494.0       | 1                      | 1   | 400.0   | 0.6   | 648.0  | TK              | UK |
| SMAJ440(C)A-HF | 492.0   | 543.0       | 1                      | 1   | 440.0   | 0.6   | 713.0  | TM              | UM |

## Rating and Characteristic Curves (SMAJ5.0(C)A-HF Thru. SMAJ440(C)A-HF)

Fig.1 - Pulse Derating Curve

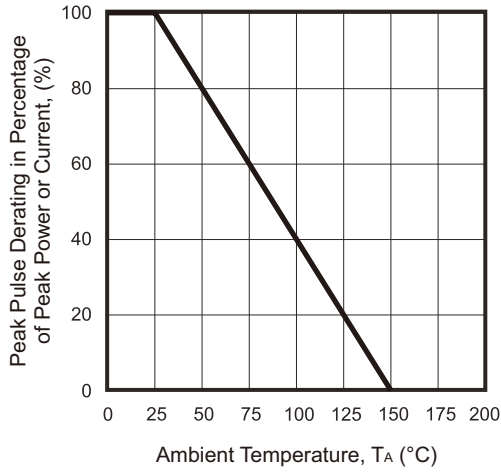


Fig.2 - Maximum Non-Repetitive Surge Current

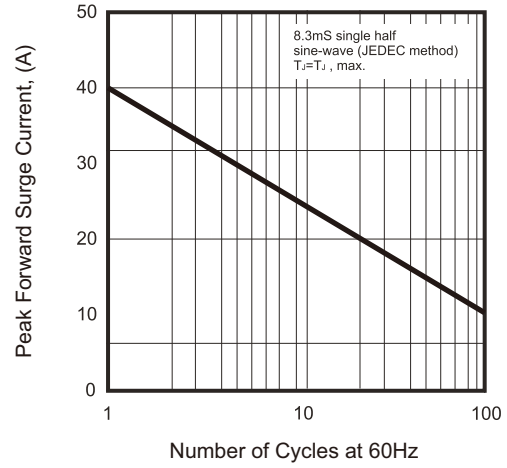


Fig.3 - Steady State Power Derating Curve

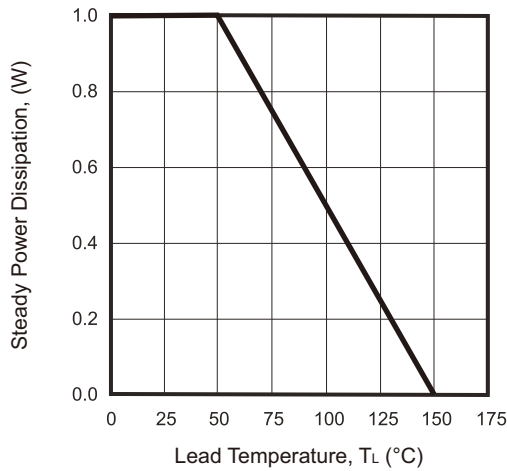


Fig.4 - Peak Pulse Power Rating Curve

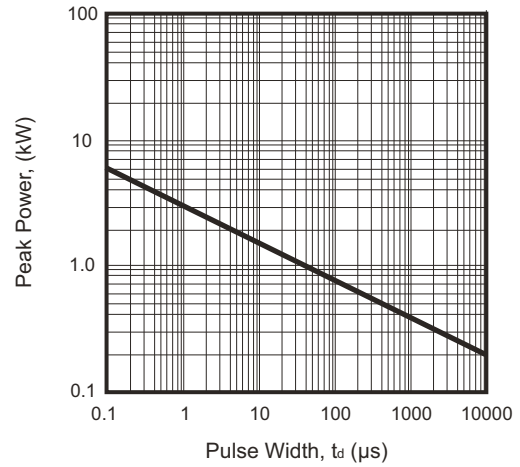
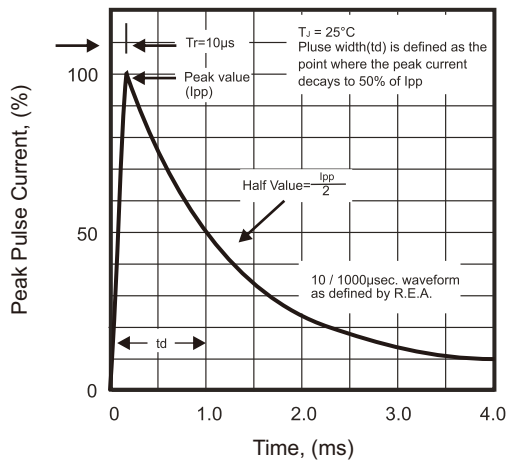
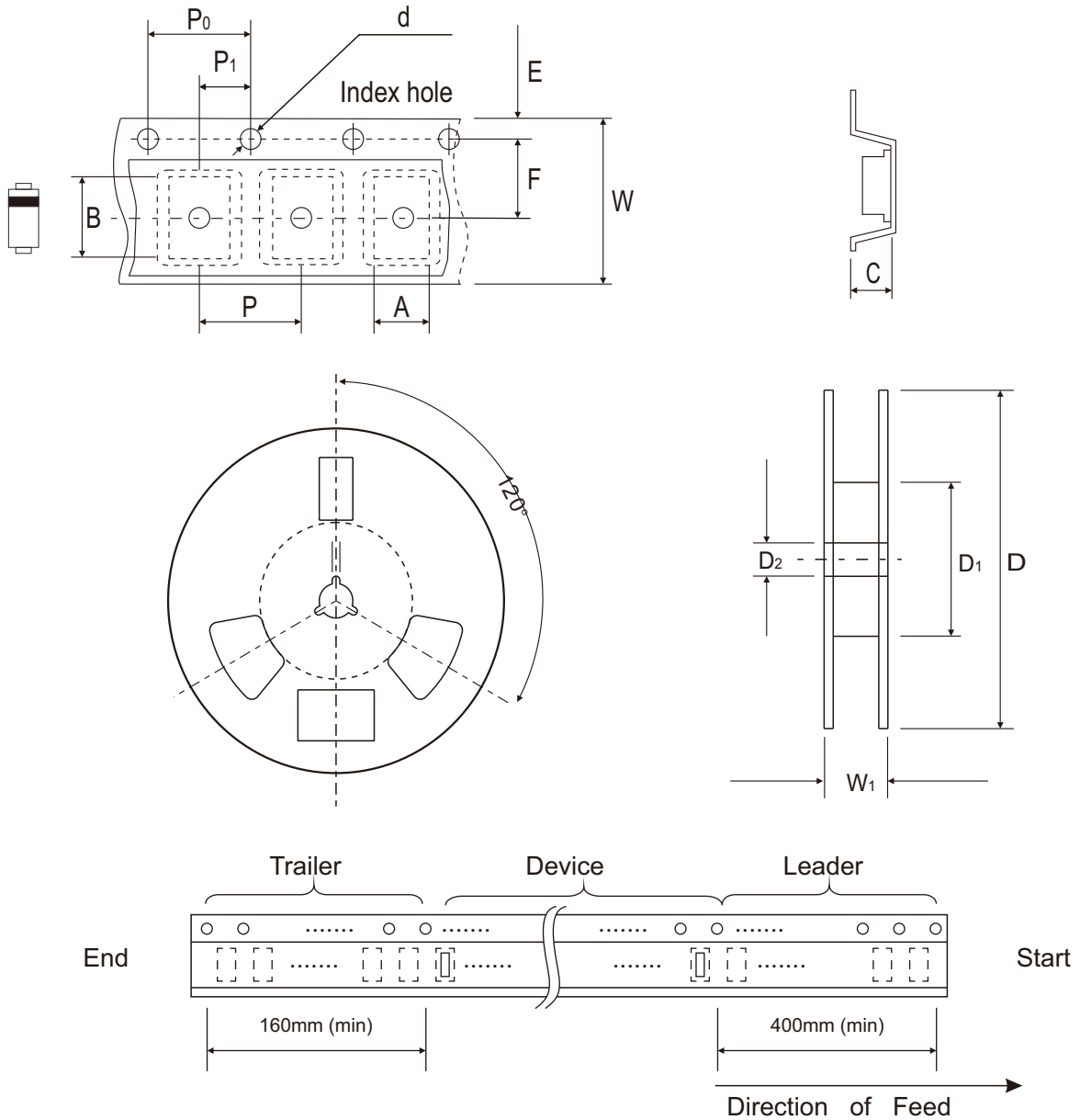


Fig.5 - Pulse Waveform



## Reel Taping Specification



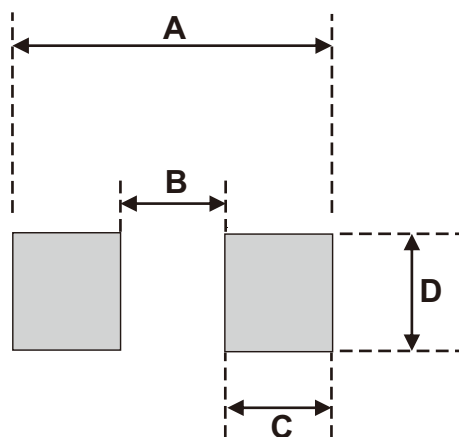
| SMA/DO-214AC | SYMBOL | A             | B             | C           | d             | D        | D1         | D2            |
|--------------|--------|---------------|---------------|-------------|---------------|----------|------------|---------------|
|              | (mm)   | 2.79 ± 0.10   | 5.33 ± 0.10   | 4.50 (max)  | 1.75 ± 0.10   | 330MAX   | 50.0 MIN.  | 13.0 ± 0.2    |
|              | (inch) | 0.110 ± 0.004 | 0.210 ± 0.004 | 0.177 (max) | 0.069 ± 0.004 | 13.00MAX | 1.969 MIN. | 0.512 ± 0.008 |

| SMA/DO-214AC | SYMBOL | E             | F             | P             | P0            | P1            | W             | W1         |
|--------------|--------|---------------|---------------|---------------|---------------|---------------|---------------|------------|
|              | (mm)   | 1.75 ± 0.10   | 5.50 ± 0.05   | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 12.0 ± 0.30   | 18.4 MAX.  |
|              | (inch) | 0.069 ± 0.004 | 0.216 ± 0.002 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.472 ± 0.012 | 0.724 MAX. |

Company reserves the right to improve product design , functions and reliability without notice. REV:A

## Suggested PAD Layout

| SIZE | DO-214AC(SMA) |        |
|------|---------------|--------|
|      | (mm)          | (inch) |
| A    | 5.58          | 0.220  |
| B    | 1.66          | 0.065  |
| C    | 1.96          | 0.077  |
| D    | 2.04          | 0.080  |



## Standard Packaging

| Case Type    | REEL PACK    |                  |
|--------------|--------------|------------------|
|              | REEL ( pcs ) | Reel Size (inch) |
| SMA/DO-214AC | 5,000        | 13               |