



November 2014

# SMCJ5V0(C)A - SMCJ170(C)A 1500 Watt Transient Voltage Suppressors

## Features

- Glass-Passivated Junction
- 1500 W Peak Pulse Power Capability on 10/1000  $\mu$ s Waveform.
- Excellent Clamping Capability
- Low-Incremental Surge Resistance
- Fast Response Time: Typically Less than 1.0 ps from 0 V to BV Minimum for Unidirectional and 5.0 ns for Bidirectional
- Typical  $I_R$  Less than 1.0  $\mu$ A Above 10 V
- UL Certificate #E258596
- UL94V-0 Flammability Classification



SMC/DO-214AB

Band denotes cathode on unidirectional devices only. No band on bi-directional devices. Bi-directional types have CA suffix where electrical characteristics apply in both directions suitable for bi-directional applications.

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol    | Parameter                                                                                          | Value      | Unit             |
|-----------|----------------------------------------------------------------------------------------------------|------------|------------------|
| $P_{PPM}$ | Peak Pulse Power Dissipation on 10/1000 $\mu$ s Waveform                                           | 1500       | W                |
| $I_{PPM}$ | Peak Pulse Current on 10/1000 $\mu$ s Waveform                                                     | See table  | A                |
| $I_{FSM}$ | Non-Repetitive Peak Forward Surge Current Superimposed on Rated Load (JEDEC Method) <sup>(1)</sup> | 200        | A                |
| $T_{STG}$ | Storage Temperature Range                                                                          | -55 to 150 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature                                                                     | 150        | $^\circ\text{C}$ |

### Note:

1. Measured on 8.3 ms single half-sine wave or equivalent square wave: duty cycle = 4 pulses per minute maximum.

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Uni-Directional<br>Bi-Directional (C)<br>Device | Part<br>Marking <sup>(2)</sup> | Reverse<br>Stand-Off<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ (V) |      | Test<br>Current<br>$I_T$ (mA) | Clamping<br>Voltage<br>at $I_{PPM}$<br>$V_C$ (V) | Peak Pulse<br>Current<br>$I_{PPM}$ (A) | Reverse<br>Leakage<br>at $V_{RWM}$<br>$I_R$ ( $\mu\text{A}$ ) <sup>(3)</sup> |
|-------------------------------------------------|--------------------------------|--------------------------------------------------|--------------------------------------|------|-------------------------------|--------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------|
|                                                 |                                |                                                  | Min.                                 | Max. |                               |                                                  |                                        |                                                                              |
| SMCJ5V0(C)A                                     | GDE                            | 5.0                                              | 6.40                                 | 7.00 | 10                            | 9.2                                              | 163.0                                  | 1000                                                                         |
| SMCJ6V0(C)A                                     | GDG                            | 6.0                                              | 6.67                                 | 7.37 | 10                            | 10.3                                             | 145.6                                  | 1000                                                                         |
| SMCJ6V5(C)A                                     | GDK                            | 6.5                                              | 7.22                                 | 7.98 | 10                            | 11.2                                             | 133.9                                  | 500                                                                          |
| SMCJ7V0(C)A                                     | GDM                            | 7.0                                              | 7.78                                 | 8.60 | 10                            | 12.0                                             | 125.0                                  | 200                                                                          |
| SMCJ7V5(C)A                                     | GDP                            | 7.5                                              | 8.33                                 | 9.21 | 1                             | 12.9                                             | 116.3                                  | 100                                                                          |
| SMCJ8V0(C)A                                     | GDR                            | 8.0                                              | 8.89                                 | 9.83 | 1                             | 13.6                                             | 110.3                                  | 50                                                                           |
| SMCJ8V5(C)A                                     | GDT                            | 8.5                                              | 9.44                                 | 10.4 | 1                             | 14.4                                             | 104.2                                  | 20                                                                           |
| SMCJ9V0(C)A                                     | GDV                            | 9.0                                              | 10.0                                 | 11.1 | 1                             | 15.4                                             | 97.4                                   | 10                                                                           |
| SMCJ10(C)A                                      | GDX                            | 10                                               | 11.1                                 | 12.3 | 1                             | 17.0                                             | 88.2                                   | 5                                                                            |
| SMCJ11(C)A                                      | GDZ                            | 11                                               | 12.2                                 | 13.5 | 1                             | 18.2                                             | 82.4                                   | 5                                                                            |
| SMCJ12(C)A                                      | GEE                            | 12                                               | 13.3                                 | 14.7 | 1                             | 19.9                                             | 75.3                                   | 5                                                                            |
| SMCJ13(C)A                                      | GEG                            | 13                                               | 14.4                                 | 15.9 | 1                             | 21.5                                             | 69.8                                   | 5                                                                            |
| SMCJ14(C)A                                      | GEK                            | 14                                               | 15.6                                 | 17.2 | 1                             | 23.2                                             | 64.7                                   | 5                                                                            |
| SMCJ15(C)A                                      | GEM                            | 15                                               | 16.7                                 | 18.5 | 1                             | 24.4                                             | 61.5                                   | 5                                                                            |
| SMCJ16(C)A                                      | GEP                            | 16                                               | 17.8                                 | 19.7 | 1                             | 26.0                                             | 57.7                                   | 5                                                                            |
| SMCJ17(C)A                                      | GER                            | 17                                               | 18.9                                 | 20.9 | 1                             | 27.6                                             | 54.3                                   | 5                                                                            |
| SMCJ18(C)A                                      | GET                            | 18                                               | 20.0                                 | 22.1 | 1                             | 29.2                                             | 51.4                                   | 5                                                                            |
| SMCJ20(C)A                                      | GEV                            | 20                                               | 22.2                                 | 24.5 | 1                             | 32.4                                             | 46.3                                   | 5                                                                            |
| SMCJ22(C)A                                      | GEX                            | 22                                               | 24.4                                 | 26.9 | 1                             | 35.5                                             | 42.3                                   | 5                                                                            |
| SMCJ24(C)A                                      | GEZ                            | 24                                               | 26.7                                 | 29.5 | 1                             | 38.9                                             | 38.6                                   | 5                                                                            |
| SMCJ26(C)A                                      | GFE                            | 26                                               | 28.9                                 | 31.9 | 1                             | 42.1                                             | 35.6                                   | 5                                                                            |
| SMCJ28(C)A                                      | GFG                            | 28                                               | 31.1                                 | 34.4 | 1                             | 45.4                                             | 33.0                                   | 5                                                                            |
| SMCJ30(C)A                                      | GFK                            | 30                                               | 33.3                                 | 36.8 | 1                             | 48.4                                             | 31.0                                   | 5                                                                            |
| SMCJ33(C)A                                      | GFM                            | 33                                               | 36.7                                 | 40.6 | 1                             | 53.3                                             | 28.1                                   | 5                                                                            |
| SMCJ36(C)A                                      | GFP                            | 36                                               | 40.0                                 | 44.2 | 1                             | 58.1                                             | 25.8                                   | 5                                                                            |
| SMCJ40(C)A                                      | GFR                            | 40                                               | 44.4                                 | 49.1 | 1                             | 64.5                                             | 23.3                                   | 5                                                                            |
| SMCJ43(C)A                                      | GFT                            | 43                                               | 47.8                                 | 52.8 | 1                             | 69.4                                             | 21.6                                   | 5                                                                            |
| SMCJ45(C)A                                      | GFV                            | 45                                               | 50.0                                 | 55.3 | 1                             | 72.7                                             | 20.6                                   | 5                                                                            |
| SMCJ48(C)A                                      | GFX                            | 48                                               | 53.3                                 | 58.9 | 1                             | 77.4                                             | 19.4                                   | 5                                                                            |
| SMCJ51(C)A                                      | GFZ                            | 51                                               | 56.7                                 | 62.7 | 1                             | 82.4                                             | 18.2                                   | 5                                                                            |
| SMCJ54(C)A                                      | GGE                            | 54                                               | 60.0                                 | 66.3 | 1                             | 87.1                                             | 17.2                                   | 5                                                                            |
| SMCJ58(C)A                                      | GGG                            | 58                                               | 64.4                                 | 71.2 | 1                             | 93.6                                             | 16.0                                   | 5                                                                            |
| SMCJ60(C)A                                      | GGK                            | 60                                               | 66.7                                 | 73.7 | 1                             | 96.8                                             | 15.5                                   | 5                                                                            |
| SMCJ64(C)A                                      | GGM                            | 64                                               | 71.1                                 | 78.6 | 1                             | 103.0                                            | 14.6                                   | 5                                                                            |
| SMCJ70(C)A                                      | GGP                            | 70                                               | 77.8                                 | 86.0 | 1                             | 113.0                                            | 13.3                                   | 5                                                                            |
| SMCJ75(C)A                                      | GGR                            | 75                                               | 83.3                                 | 92.1 | 1                             | 121.0                                            | 12.4                                   | 5                                                                            |
| SMCJ78(C)A                                      | GGT                            | 78                                               | 86.7                                 | 95.8 | 1                             | 126.0                                            | 11.9                                   | 5                                                                            |

### Notes:

2. Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.
3. For bidirectional parts with  $V_{RWM} < 10\text{ V}$ , the  $I_R$  max limit is doubled.

**Electrical Characteristics** (Continued)Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Uni-Directional<br>Bi-Directional (C)<br>Device | Part<br>Marking <sup>(2)</sup> | Reverse<br>Stand-Off<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ (V) |       | Test<br>Current<br>$I_T$ (mA) | Clamping<br>Voltage<br>at $I_{PPM}$<br>$V_C$ (V) | Peak Pulse<br>Current<br>$I_{PPM}$ (A) | Reverse<br>Leakage<br>at $V_{RWM}$<br>$I_R$ ( $\mu\text{A}$ ) <sup>(3)</sup> |
|-------------------------------------------------|--------------------------------|--------------------------------------------------|--------------------------------------|-------|-------------------------------|--------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------|
|                                                 |                                |                                                  | Min.                                 | Max.  |                               |                                                  |                                        |                                                                              |
| SMCJ85(C)A                                      | GGV                            | 85                                               | 94.4                                 | 104.0 | 1                             | 137.0                                            | 10.9                                   | 5                                                                            |
| SMCJ90(C)A                                      | GGX                            | 90                                               | 100.0                                | 111.0 | 1                             | 146.0                                            | 10.3                                   | 5                                                                            |
| SMCJ100(C)A                                     | GGZ                            | 100                                              | 111.0                                | 123.0 | 1                             | 162.0                                            | 9.3                                    | 5                                                                            |
| SMCJ110(C)A                                     | GHE                            | 110                                              | 122.0                                | 135.0 | 1                             | 177.0                                            | 8.5                                    | 5                                                                            |
| SMCJ120(C)A                                     | GHG                            | 120                                              | 133.0                                | 147.0 | 1                             | 193.0                                            | 7.8                                    | 5                                                                            |
| SMCJ130(C)A                                     | GHK                            | 130                                              | 144.0                                | 159.0 | 1                             | 209.0                                            | 7.2                                    | 5                                                                            |
| SMCJ150(C)A                                     | GHM                            | 150                                              | 167.0                                | 185.0 | 1                             | 243.0                                            | 6.2                                    | 5                                                                            |
| SMCJ160(C)A                                     | GHP                            | 160                                              | 178.0                                | 197.0 | 1                             | 259.0                                            | 5.8                                    | 5                                                                            |
| SMCJ170(C)A                                     | GHR                            | 170                                              | 189.0                                | 209.0 | 1                             | 275.0                                            | 5.5                                    | 5                                                                            |

**Notes:**

2. Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.
3. For bidirectional parts with  $V_{RWM} < 10$  V, the  $I_R$  max limit is doubled.

## Typical Performance Characteristics

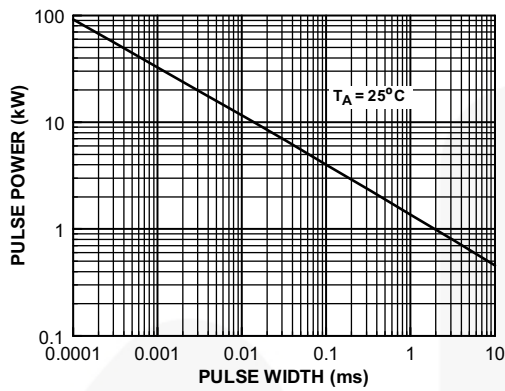


Figure 1. Peak Pulse Power Rating Curve

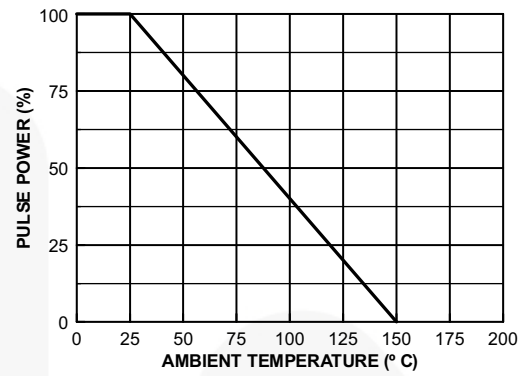


Figure 2. Pulse Derating Curve

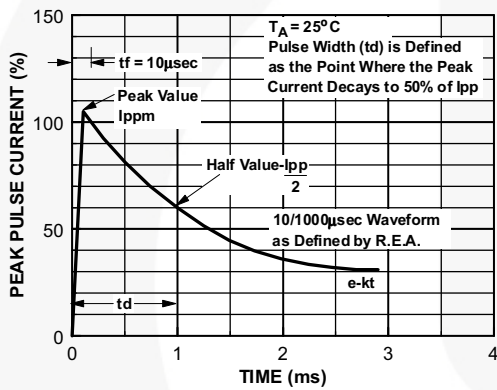


Figure 3. Pulse Waveform

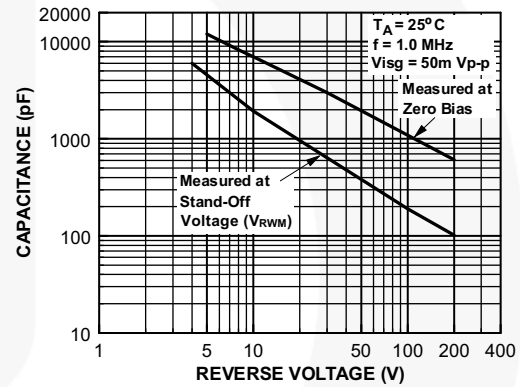
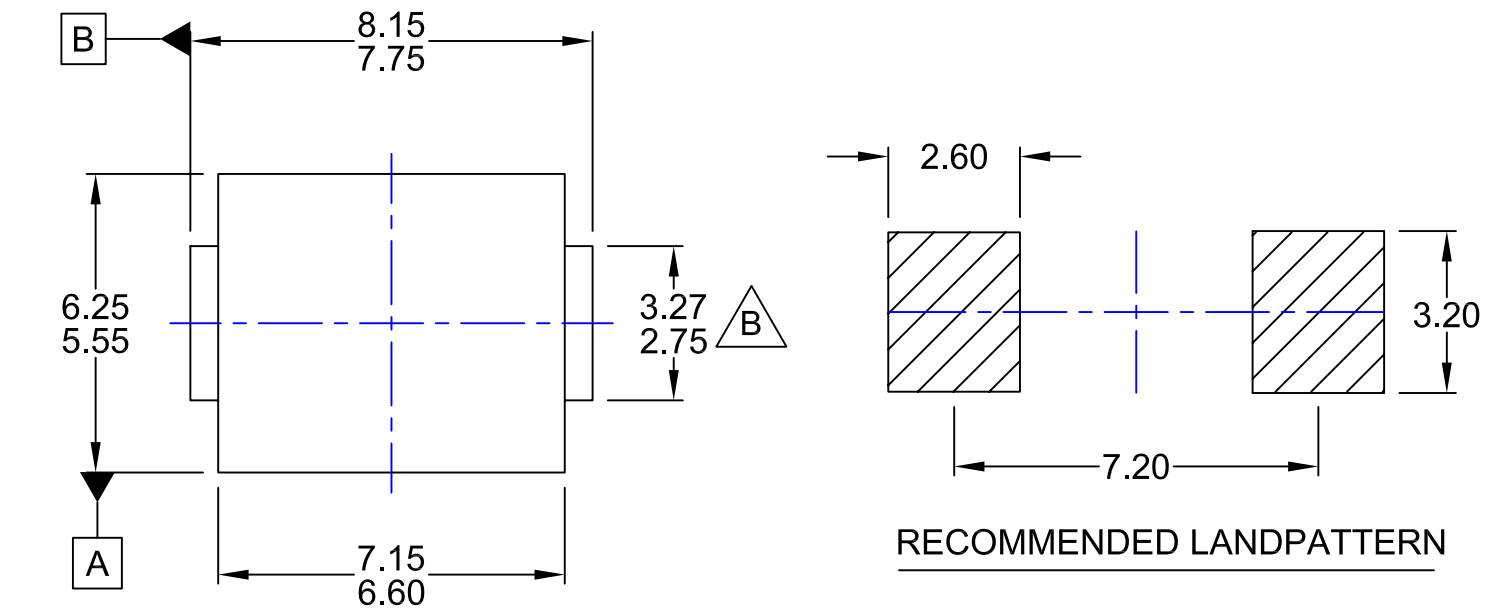


Figure 4. Junction Capacitance

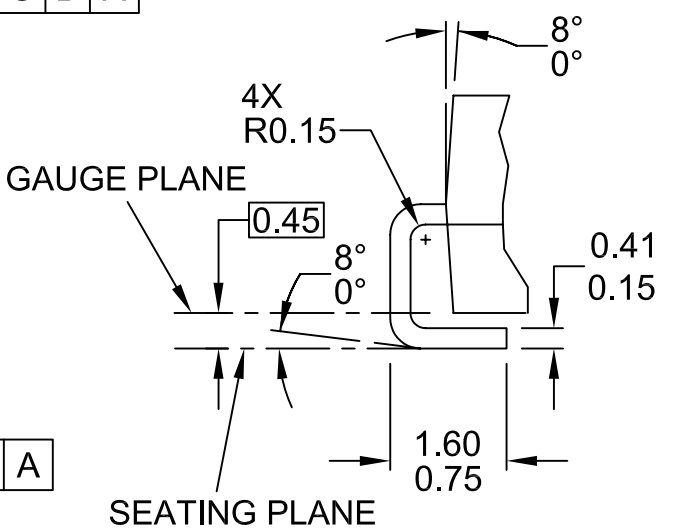
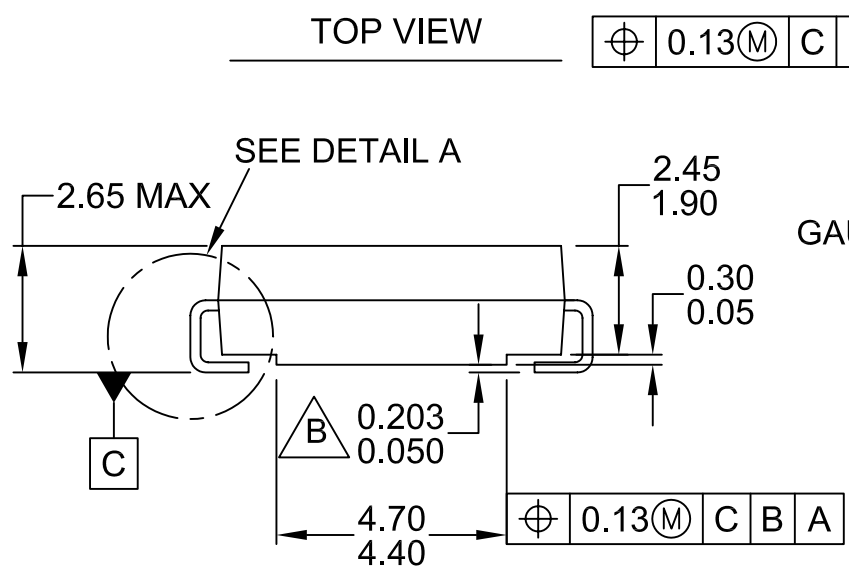


Figure 5. Non-Repetitive Surge Current

| REVISIONS |                             |           |             |
|-----------|-----------------------------|-----------|-------------|
| LTR       | DESCRIPTION                 | DATE      | DRAWN/SITE  |
| 1         | RELEASE TO DOCUMENT CONTROL | 29 APR 08 | SD LEE/FSSZ |



RECOMMENDED LANDPATTERN



NOTES:

- A. EXCEPT WHERE NOTED CONFORMS TO JEDEC DO-214, VARIATION AB.
- B. DOES NOT COMPLY TO JEDEC STD. VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS.
- E. DIMENSIONS AND TOLERANCING AS PER ASME Y14.5M-1994
- F. LAND PATTERN STANDARD: DIOM7957X241M
- G. DRAWING FILE NAME: DO214ABREV1

DETAIL A

SCALE: 2:1

|                         |  |               |                                                                              |                               |
|-------------------------|--|---------------|------------------------------------------------------------------------------|-------------------------------|
| APPROVALS               |  | DATE          | <b>FAIRCHILD</b><br>SEMICONDUCTOR™<br>2LD, SMC, JEDEC<br>DO-214 VARIATION AB |                               |
| DRAWN:                  |  | BOBOY MALDO   |                                                                              |                               |
| CHECKED:                |  | SANGDO LEE    |                                                                              |                               |
| APPROVED:               |  | LITO GALERA   |                                                                              |                               |
| HOWARD ALLEN            |  |               |                                                                              |                               |
| PROJECTION<br>INCH (MM) |  | SCALE<br>1:1  | SIZE<br>N/A                                                                  | DRAWING NUMBER<br>MKT-DO214AB |
| FORMERLY: N/A           |  | SHEET: 1 OF 1 |                                                                              |                               |



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| Awinda®                                                                           | FRFET®                                         |  | TinyBoost®                                                                          |
| AX-CAP®*                                                                          | Global Power Resource™                         | PowerTrench®                                                                      | TinyBuck®                                                                           |
| BitSiC™                                                                           | GreenBridge™                                   | PowerXS™                                                                          | TinyCalc™                                                                           |
| Build it Now™                                                                     | Green FPS™                                     | Programmable Active Droop™                                                        | TinyLogic®                                                                          |
| CorePLUS™                                                                         | Green FPS™ e-Series™                           | QFET®                                                                             | TINYOPTO™                                                                           |
| CorePOWER™                                                                        | Gmax™                                          | QS™                                                                               | TinyPower™                                                                          |
| CROSSVOLT™                                                                        | GTO™                                           | Quiet Series™                                                                     | TinyPWM™                                                                            |
| CTL™                                                                              | IntelliMAX™                                    | RapidConfigure™                                                                   | TinyWire™                                                                           |
| Current Transfer Logic™                                                           | ISOPLANAR™                                     |  | TranSiC™                                                                            |
| DEUXPEED®                                                                         | Making Small Speakers Sound Louder and Better™ | Saving our world, 1mW/W/kW at a time™                                             | TriFault Detect™                                                                    |
| Dual Cool™                                                                        | MegaBuck™                                      | SignalWise™                                                                       | TRUECURRENT®*                                                                       |
| EcoSPARK®                                                                         | MICROCOUPLER™                                  | SmartMax™                                                                         | μSerDes™                                                                            |
| EfficientMax™                                                                     | MicroFET™                                      | SMART START™                                                                      |  |
| ESBC™                                                                             | MicroPak™                                      | Solutions for Your Success™                                                       | UHC®                                                                                |
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| FACT Quiet Series™                                                                | MotionGrid®                                    | SuperSOT™-3                                                                       | VisualMax™                                                                          |
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| FAST®                                                                             | MTx®                                           | SuperSOT™-8                                                                       | XS™                                                                                 |
| FastvCore™                                                                        | MVN®                                           | SupreMOS®                                                                         | Xsens™                                                                              |
| FETBench™                                                                         | mWSaver®                                       | SyncFET™                                                                          | 仙童™                                                                                 |
| FPS™                                                                              | OptoHit™                                       | Sync-Lock™                                                                        |                                                                                     |
|                                                                                   | OPTOLOGIC®                                     |                                                                                   |                                                                                     |

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| Datasheet Identification | Product Status        | Definition                                                                                                                                                                                          |
|--------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advance Information      | Formative / In Design | Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.                                                                       |
| Preliminary              | First Production      | Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
| No Identification Needed | Full Production       | Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.                                               |
| Obsolete                 | Not In Production     | Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.                                                    |

Rev. I72

# AMEYA360

Components Supply Platform

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QQ         800077892  
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