3.0A SURFACE MOUNT SUPER-FAST RECTIFIER

ES3A-ES3D

FEATURES

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Low Forward Voltage Drop and High Current Capability
- Surge Overload Rating to 100A Peak
- Ideally Suited for Automated Assembly
- Plastic Material: UL Flammability Classification Rating 94V-0

MECHANICAL DAT A

- Case: Molded Plastic
- Terminals: Solder Plated Terminal - Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band or Cathode Notch
- SMB Weight: 0.093 grams (approx.)
- SMC Weight: 0.21 grams (approx.)
- Mounting Position: Any
- Marking: Type Number
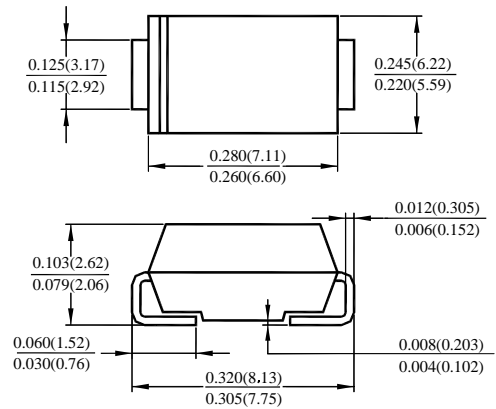
Dimensions in inches and (millimeters)
DO-214AB (SMC)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Characteristic	Symbol	ES3A/B	ES3B/B	ES3C/B	ES3D/B	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	150	200	V
RMS Reverse Voltage	$V_{R(RMS)}$	35	70	105	140	V
Average Rectified Output Current @ $T_T = 100°C$	I_O	3.0				A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load (JEDEC Method)	I_{FSM}	100				A
Forward Voltage @ $I_F = 3.0A$	V_{FM}	0.9				V
Peak Reverse Current @ $T_A = 25°C$ at Rated DC Blocking Voltage @ $T_A = 125°C$	I_{RM}	10 500				μA
Reverse Recovery Time (Note 3)	t_{rr}	25				ns
Typical Junction Capacitance (Note 2)	C_j	45				pF
Typical Thermal Resistance, Junction to Terminal (Note 1)	$R_{\theta JT}$	15				K/W
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150				°C

Notes:
1. Unit mounted on PC board with 5.0 mm^2 (0.013 mm thick) copper pads as heat sink.
2. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
3. Measured with $I_F = 0.5A$, $I_R = 1.0A$, $I_{rr} = 0.25A$. See Figure 5.
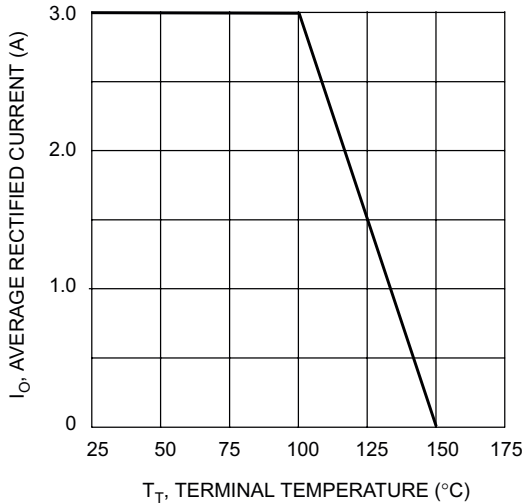
ES3A-ES3D   Typical   Characteristics

I_O, AVERAGE RECTIFIED CURRENT (A)

T_T, TERMINAL TEMPERATURE (°C)
Fig. 1 Forward Current Derating Curve

I_F, INSTANTANEOUS FORWARD CURRENT (A)

T_j = 25°C
Pulse Width: 300µs
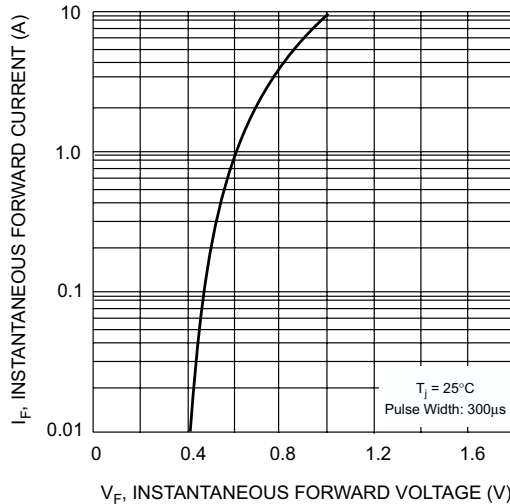
V_F, INSTANTANEOUS FORWARD VOLTAGE (V)
Fig. 2 Typical Forward Characteristics

I_{FSM}, PEAK FORWARD SURGE CURRENT (A)

Single Half-Sine-Wave
(JEDEC Method)
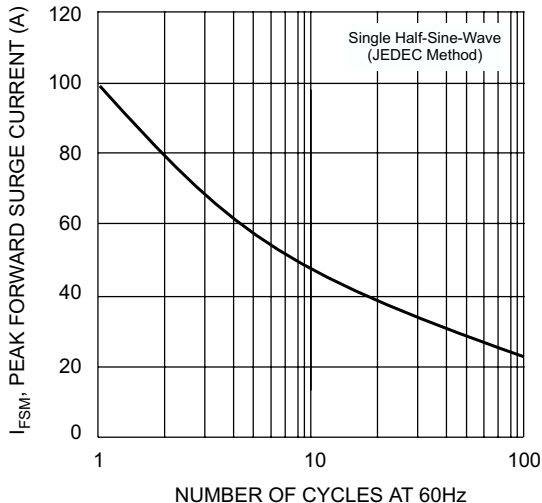
NUMBER OF CYCLES AT 60Hz
Fig. 3 Surge Current Derating Curve

I_R, INSTANTANEOUS REVERSE CURRENT (A)

T_j = 125°C

T_j = 25°C

PERCENT OF RATED PEAK REVERSE VOLTAGE (%)
Fig. 4 Typical Reverse Characteristics

50Ω NI (Non-inductive)   10Ω NI

Device
Under
Test

(-)

(+)   50V DC
Approx

(-)

Pulse
Generator
(Note 2)

1.0Ω
NI   Oscilloscope
(Note 1)

(+)

t_{rr}

+0.5A

0A

-0.25A

-1.0A
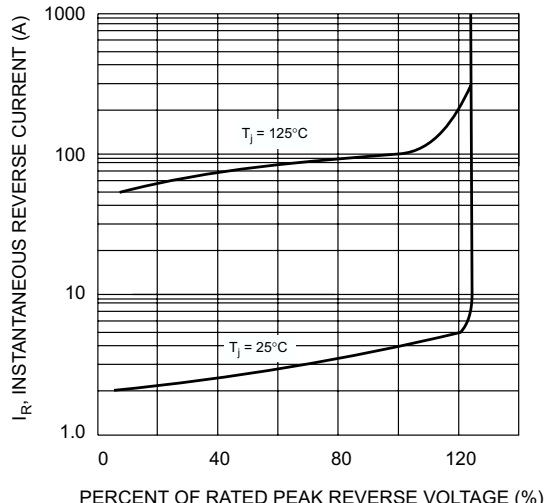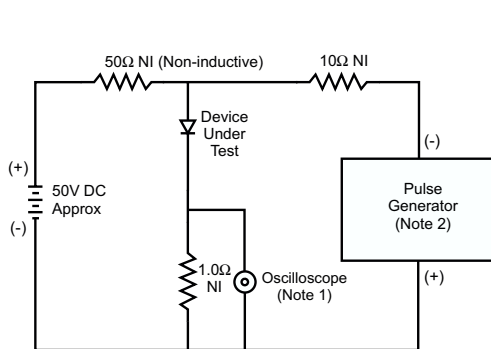
Set time base for 50/100 ns/cm

Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
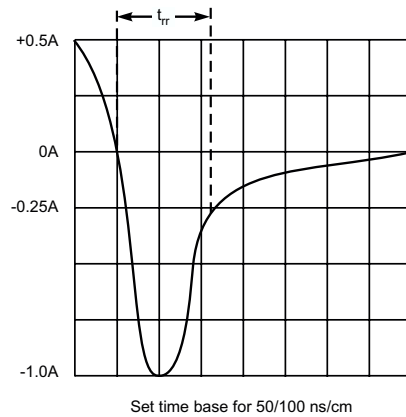2. Rise Time = 10ns max. Input Impedance = 50Ω.

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit