Ultra Low VF 1 Amp Schottky Barrier Rectifiers

UPS5817(e3), UPS5819(e3)

Product Overview

The Microchip UPS5817–UPS5819e3 in Powermite 1 package, high efficiency rectifiers offer optimized forward voltage characteristics with reverse blocking capabilities of 20 and 40 volts. They are ideal for surface mount applications that operate at high frequencies. They offer high current/power capabilities previously only found in much larger packages.

In addition to its size advantages, Powermite 1 package features include a full metallic bottom that eliminates possibility of solder flux entrapment during assembly and a unique locking tab acts as an efficient heat path from die to mounting plane for external heat sinking with very low thermal resistance junction to case (bottom). Its innovative design makes this device ideal for use with automatic insertion equipment. RoHS compliant versions are available.

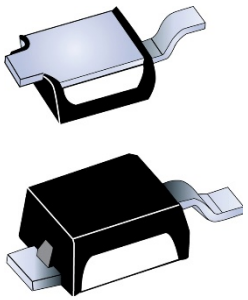
Features

- Low thermal resistance DO-216AA package for higher current operation
- Ultra low forward voltage drop
- Efficient heat path with Integral locking bottom metal tab
- High current capability with low forward voltage
- Guard-ring die construction for transient protection
- Full metallic bottom eliminates flux entrapment
- Compatible with automatic insertion equipment
- Low profile-maximum height of 1.14 mm
- Supplied in 8 mm tape and reel
- RoHS compliant versions available

Applications/Benefits

- Silicon Schottky (hot carrier) rectifier for minimal t_{rr} and minimal reverse recovery voltage
- Elimination of reverse-recovery oscillations to reduce need for EMI filtering
- For use in high-frequency switching power supplies, inverters, free-wheeling diode applications, charge pump circuits, and polarity protection applications
- Low forward power loss and high efficiency
- Reduces reverse recovery loss with low I_{RM}
- Robust package configuration for pick-and-place handling
- Full-metallic bottom eliminates flux entrapment
- Ideal as an OR'ing diode
- Small foot print (See Pad Layout details)

Figure 1. Powermite 1 (DO-216AA) Package



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1. Maximum Ratings

Table 1-1. Maximum Ratings at 25 °C Unless Otherwise Specified

Parameters/Test Conditions	Symbol	Value		Unit
		UPS5817	UPS5819	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	20	40	V
RMS Reverse Voltage	$V_{R(RMS)}$	14	28	V
Junction and Storage Temperature	T_J and T_{STG}	–55 to +150		°C
Thermal Resistance Junction-to-Case	$R_{\Theta JC}$	15		°C/W
Thermal Resistance Junction-to-Ambient [1]	$R_{\Theta JA}$	240		°C/W
Average Rectified Output Current at T_C = 135 °C	I_O	1.0		A
Repetitive Peak Forward Current	I_{FRM}	2.0		A
Surge Peak Forward Current	I_{FSM}	50		A
Voltage Rate of Change at Rated V_R and T_J = 25 °C	dV/dt	10,000		V/µs
Solder Temperature at 10 seconds	T_{SP}	260		°C

Note:

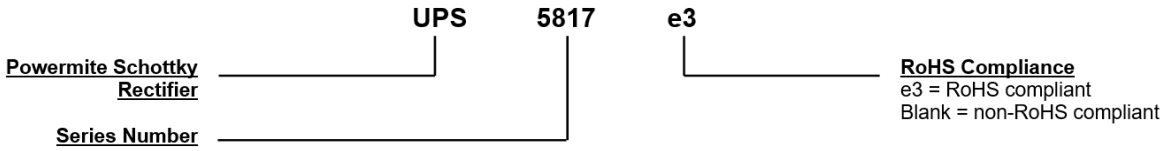
1. Mounted on FR-4 PC board using 1 oz copper with recommended minimum foot print

1.1. Mechanical Packaging

- Case: Molded epoxy package meets UL94V-0
- Terminals: Copper with annealed matte-tin plating for RoHS compliance. Solderable per MIL-STD-750 method 2026.
  (Consult factory for tin-lead plating)
- Marking: Date code, body marked with “S17” or “S19”
- Polarity: Cathode designated by Tab 1 (bottom)
- Tape and Reel Option: Packaging per EIA-481-B with 8 mm tape. Consult factory for quantities.
- Weight: Approximately 0.016 grams
- See Package Dimensions

2. Part Nomenclature

Figure 2-1. Part Nomenclature



2.1. Electrical Characteristics

Table 2-1. Ratings

Rating (Conditions)	Symbol	Value		Unit
		UPS5817	UPS5819	
Maximum Instantaneous Forward Voltage [2] (I_F = 1.0A, T_J = +25 °C)	V_F	0.45	0.55	Volts
Maximum Instantaneous Reverse Current [2] (at V_{RWM}, T_J = +25 °C)	I_{RM}	1.0	1.0	mA
Typical Junction Capacitance (V_R = 5V, f = 1 MHz)	C_J	105	60	pF

Note:
1: Measured with a test pulse of 380 µs to minimize self-heating effect

Table 2-2. Electrical Characteristics

Part Number	Device Marking [1]	Working Peak Reverse Voltage	Max Reverse Current [2]	RMS Reverse Voltage	Max Forward Voltage [2] V_F	Typical Capacitance at V_R = 5V at f = 1 MHz
		V_{RWM}	I_R at V_{RWM}	$V_{R(RMS)}$	at I_F = 1A	C_T
		V	mA	V	V	pF
UPS5817	S17	20	1	14	0.45	105
UPS5819	S19	40	1	28	0.55	60

Notes:
1. Include • in marking for e3 parts (e.g. UPS120e3 and S20•)
2. Short duration test pulse used to minimize self-heating effect

3. Graphs

Figure 3-1. Thermal Impedance Junction to Case

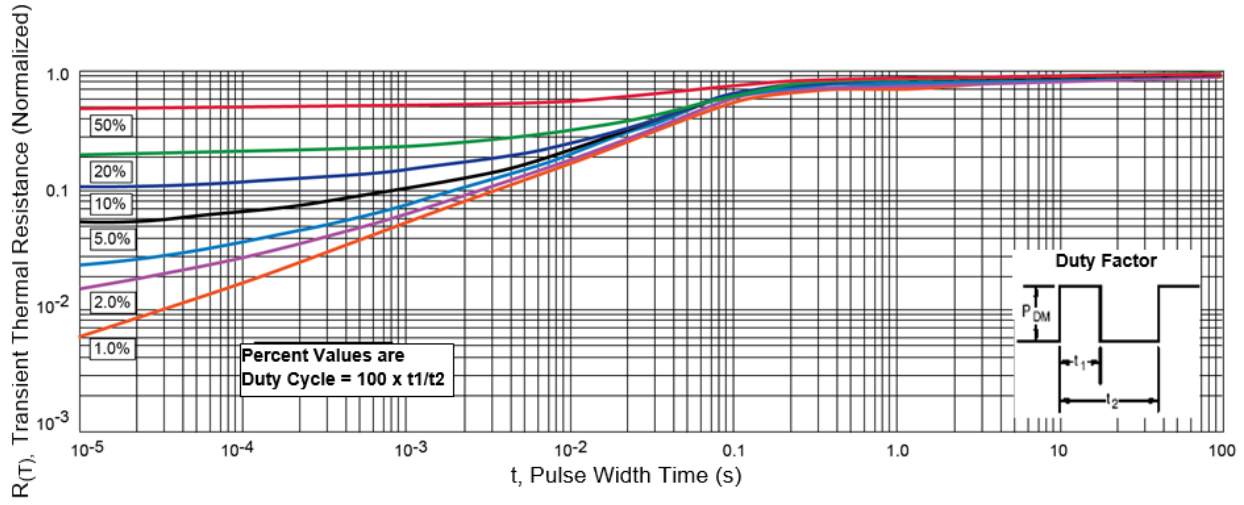
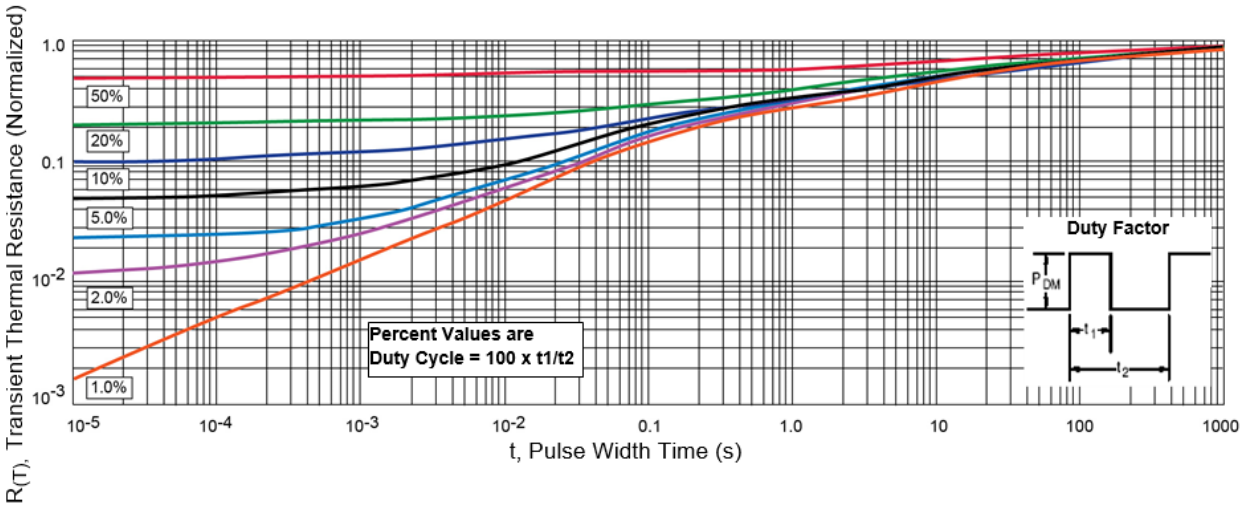
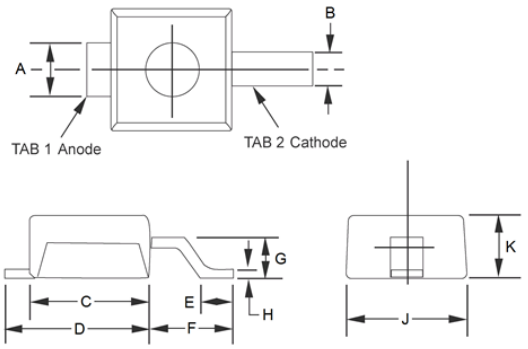


Figure 3-2. Thermal Impedance Junction to Ambient



4. Package Dimensions

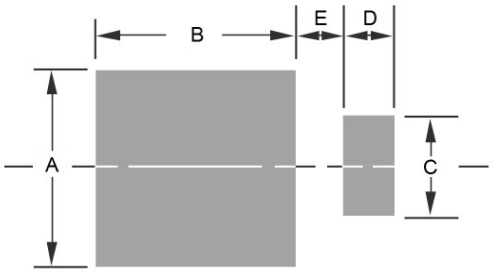
Figure 4-1. Package Dimensions



Ltr	Dimensions			
	Inch		Millimeters	
	Min.	Max.	Min.	Max.
A	0.029	0.039	0.73	0.99
B	0.016	0.026	0.40	0.66
C	0.070	0.080	1.77	2.03
D	0.087	0.097	2.21	2.46
E	0.020	0.030	0.50	0.76
F	0.051	0.061	1.29	1.54
G	0.021	0.031	0.53	0.78
H	0.004	0.008	0.10	0.20
J	0.070	0.080	1.77	2.03
K	0.035	0.045	0.89	1.14

4.1. Pad Layout

Figure 4-2. Pad Layout



Ltr	Dimensions	
	Inch	Millimeters
A	0.100	2.54
B	0.105	2.67
C	0.050	1.27
D	0.030	0.76
E	0.025	0.64

4.2. Schematic

Figure 4-3. Schematic

5. Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

Revision	Date	Description
A	04/2025	Document was converted to Microchip template and assigned literature numbe DS00005925.
Rev B	12/2024	Microsemi document was created and assigned literature number RF01129.

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