PolySwitch Resettable Devices
Product Selection Guide

Table 1 PolySwitch Device Characteristics

PolySwitch Device Family	V_{MAX} Operating (V_{DC})	V_{MAX} Interrupt (V_{RMS})	I_H (A)	Temp. Range	Form Factor	Agency Spec.	Application
LVR	120V/240V	135V/265V	0.05 to 2A	-20 to 85˚C	Radial-leaded	UL, CSA, TÜV	Line Voltage
LVRL	120V	135V	0.75 to 2A	-20 to 85˚C	Radial-leaded	UL, CSA, TÜV	Line Voltage
RGEF	16V	-	2.5 to 14.0A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	General Electronics
RHEF	16 to 30V	-	0.5 to 15A	-40 to 125˚C	Radial-leaded	UL, CSA, TÜV	General Electronics
RTEF	33V	-	1.2 to 1.9A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	General Electronics
RUEF	30V	-	0.9 to 9.0A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	General Electronics
RKEF	60V	-	0.50 to 5A	-40 to 85˚C	Radial-leaded	UL,TÜV	General Electronics
RXEF	60 to 72V	-	0.05 to 3.75A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	General Electronics
RUSBF	6 to 16V	-	0.75 to 2.5A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	Computer/General Electronics
microSMD	6 to 30V	-	0.05 to 2.0A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
midSMD	6 to 60V	-	0.3 to 2.0A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
miniSMDC	6 to 60V	-	0.14 to 2.6A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
miniSMDE	16V	-	1.9A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
nanoSMDC	6 to 48V	-	0.12 to 2.0A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
picoSMD	6V	-	0.35A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
SMD	6 to 60V	-	0.3 to 3.0A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
SMD2	15 to 33V	-	1.5 to 2.5A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Computer/General Electronics
AGRF	16V	-	4.0 to 14.0A	-40 to 85˚C	Radial-leaded	-	Automotive
AHRF	16 to 30V	-	0.50 to 15A	-40 to 125˚C	Radial-leaded	-	Automotive
AHS	16V	-	0.80 to 3.0A	-40 to 125˚C	Surface-mount	-	Automotive
ASMD	16 to 30V	-	0.23 to 1.97A	-40 to 85˚C	Surface-mount	-	Automotive
AHEF	32V	-	0.50 to 10A	-40 to 125˚C	Radial-leaded	-	Automotive
BBRF	99V	-	0.55 to 0.75A	-40 to 85˚C	Radial-leaded	UL, CSA	Telecom & Networking
TCF	60V	250V	0.10 to 0.18A	-40 to 85˚C	Chip	-	Telecom & Networking
TRF250	60 to 100V	250V	0.08 to 0.184A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	Telecom & Networking
TRF600	250V	600V	0.15 to 0.40A	-40 to 85˚C	Radial-leaded	UL, CSA, TÜV	Telecom & Networking
TS250/TSV250	60V	250V	0.13A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Telecom & Networking
TSL250	80V	250V	0.08A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Telecom & Networking
TS600/TSM600	60 to 250V	600V	0.17 to 0.40A	-40 to 85˚C	Surface-mount	UL, CSA, TÜV	Telecom & Networking
MXP	6V	-	1.9A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
LR4	15 to 20V	-	1.7 to 13.0A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
LTP	15 to 24V	-	0.7 to 3.4A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
SRP	15 to 30V	-	1.2 to 4.2A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
VLP	16V	-	2.1 to 2.7A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
VLR	12V	-	1.7 to 2.3A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery
VTP	16V	-	1.1 to 2.4A	-40 to 85˚C	Axial-leaded	UL, CSA, TÜV	Battery

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![Tyco Electronics]

Table 2 **Thermal Derating**

PolySwitch Device Family	-40°C	-20°C	0°C	20°C	25°C	30°C	40°C	50°C	60°C	70°C	85°C	125°C
LVR005-055	-	1.48	1.24	1.00	0.99	0.93	0.82	0.72	0.60	0.51	0.35	-
LVR075-200	-	1.69	1.34	1.00	0.99	0.95	0.88	0.80	0.73	0.66	0.55	-
LVRL	-	1.43	1.21	1.00	0.99	0.95	0.86	0.78	0.70	0.62	0.50	-
RGEF	1.54	1.37	1.21	1.04	1.00	0.96	0.88	0.79	0.71	0.63	0.50	-
RHEF	1.50	1.35	1.19	1.04	1.00	0.96	0.88	0.81	0.73	0.65	0.54	0.23
RTEF	1.48	1.32	1.16	1.00	0.96	0.92	0.84	0.76	0.68	0.60	0.48	-
RUEF	1.48	1.32	1.16	1.00	0.96	0.92	0.84	0.76	0.68	0.60	0.48	-
RKEF	1.45	1.30	1.15	1.00	0.97	0.92	0.83	0.77	0.68	0.61	0.52	-
RXEF	1.56	1.37	1.19	1.00	0.95	0.91	0.82	0.72	0.63	0.54	0.40	-
RUSBF	1.41	1.27	1.14	1.00	0.97	0.93	0.87	0.80	0.73	0.66	0.56	-
microSMD	1.45	1.30	1.15	1.00	0.96	0.93	0.85	0.78	0.70	0.63	0.51	-
midSMD	1.41	1.27	1.14	1.00	0.97	0.93	0.87	0.80	0.73	0.66	0.56	-
miniSMD	1.45	1.30	1.15	1.00	0.96	0.93	0.85	0.78	0.70	0.63	0.51	-
nanoSMD	1.56	1.39	1.15	1.04	1.00	0.96	0.87	0.79	0.70	0.61	0.49	-
picoSMD	1.45	1.30	1.15	1.00	0.96	0.93	0.85	0.78	0.70	0.63	0.51	-
SMD	1.45	1.30	1.15	1.00	0.96	0.93	0.85	0.78	0.70	0.63	0.51	-
AGRF	1.54	1.37	1.21	1.04	1.00	0.96	0.88	0.79	0.71	0.63	0.50	-
AHRF	1.50	1.35	1.19	1.04	1.00	0.96	0.88	0.81	0.73	0.65	0.54	0.23
AHS	1.41	1.28	1.16	1.03	1.00	0.97	0.91	0.84	0.78	0.72	0.62	0.37
ASMD	1.59	1.41	1.23	1.05	1.00	0.95	0.86	0.77	0.68	0.59	0.45	-
AHEF	1.36	1.25	1.14	1.03	1.00	0.96	0.89	0.81	0.74	0.66	0.55	0.20
BBRF	1.56	1.37	1.19	1.00	0.95	0.91	0.82	0.72	0.63	0.54	0.40	-
TCF	1.54	1.36	1.18	1.00	0.96	0.91	0.82	0.73	0.64	0.55	0.42	-
TRF	1.54	1.36	1.18	1.00	0.96	0.91	0.82	0.73	0.64	0.55	0.42	-
TS	1.54	1.36	1.18	1.00	0.96	0.91	0.82	0.73	0.64	0.55	0.42	-
MXP	1.99	1.68	1.37	1.07	1.00	0.91	0.76	0.61	0.45	0.30	0.07	-
LR4	1.41	1.27	1.14	1.00	0.97	0.93	0.87	0.80	0.73	0.66	0.56	-
LTP	1.72	1.48	1.24	1.00	0.94	0.88	0.76	0.64	0.52	0.40	0.22	-
SRP	1.47	1.31	1.16	1.00	0.96	0.92	0.85	0.77	0.69	0.61	0.50	-
VLP	1.88	1.67	1.43	1.05	1.00	0.95	0.76	0.62	0.48	0.33	0.04	-
VLR	2.05	1.70	1.41	1.08	1.00	0.92	0.74	0.59	0.41	0.18	-	-
VTP	1.88	1.67	1.43	1.05	1.00	0.95	0.76	0.62	0.48	0.33	0.04	-

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PolySwitch Device Selection Guide

Step 1. Determine your circuit's parameters

You will need to determine the following parameters of your circuit:

Maximum ambient operating temperature

Normal operating current

Maximum operating voltage

Maximum interrupt current

Step 2. Select a PolySwitch device that will accommodate the circuit's maximum ambient temperature and normal operating current.

Use the Thermal Derating [hold Current (A) at Ambient Temperature (°C)] table and choose the temperature that most closely matches the circuit's maximum ambient temperature. Look down that column to find the value equal to or greater than the circuit's normal operating current. Now look to the far left of that row to find the part family or part for the PolySwitch device that will best accommodate the circuit.

Step 3. Compare the selected device's maximum electrical ratings with the circuit's maximum operating voltage and interrupt current.

Use the Electrical Characteristics table to verify the part you selected in Step 2 will handle your circuit's maximum operating voltage and interrupt current. Find the device's maximum operating voltage (V_{MAX}) and maximum interrupt current (I_{MAX}). Ensure that V_{MAX} and I_{MAX} are greater than or equal to the circuit's maximum operating voltage and maximum interrupt current.

Step 4. Determine time-to-trip

Time-to-trip is the amount of time it takes for a device to switch to a high-resistance state once a fault current has been applied across the device. Identifying the PolySwitch device's time-to-trip is important in order to provide the desired protection capabilities. If the device you choose trips too fast, undesired or nuisance tripping will occur. If the device trips too slowly, the components being protected may be damaged before the device switches to a high-resistance state.

Use the Typical Time-to-trip Curves at 20°C to determine if the PolySwitch device's time-to-trip is too fast or too slow for the circuit. If it is go back to Step 2 and choose an alternate device.

Step 5. Verify ambient operating temperature

Ensure that your application's minimum and maximum ambient temperatures are within the operating temperature of the PolySwitch device. Most PolySwitch devices have an operating temperature range from -40°C to 85°C with some exceptions to 125°C.

Step 6. Verify the PolySwitch device dimensions

Use the Dimensions table to compare the dimensions of the PolySwitch device you selected with the application's space considerations.

Definitions of terms

I_H	the maximum steady state current at 20°C that can be passed through a PolySwitch device without causing the device to trip
I_T	the minimum current that will cause the PolySwitch device to trip at 20°C
V_{MAX}	the maximum voltage that can safely be dropped across a PolySwitch device in its tripped state also called: Maximum Device Voltage, Maximum Voltage, Vmax, Max Interrupt Voltage
I_{MAX}	the maximum fault current that can safely be used to trip a PolySwitch device
P_D	the power (in watts) dissipated by a PolySwitch device in its tripped state
R_{MAX}	the maximum resistance prior to the trip of PolySwitch device
R_{MIN}	the minimum resistance prior to the trip of PolySwitch device
R_{1MAX}	the maximum resistance of a PolySwitch device at 20°C 1 hour after being tripped or after reflow soldering. Also called: Maximum Resistance
$R_{Tripped\ Typ}$	the typical resistance of PolySwitch 1 hour after the initial trip and reset

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