

1200V, 8 OHM, BIDIRECTIONAL SiC CURRENT LIMITING DEVICE WITH EXTENDED SHORT-CIRCUIT CAPABILITIES

FEATURES

- ▲ Low Saturation/Nominal current ratio.
- ▲ Excellent current clamping capabilities (almost flat I-V curve).
- ▲ Breakdown voltage above 1200V in forward mode.
- ▲ Negative temperature coefficient of I_{DS} .
- ▲ Reverse conduction.

ADVANTAGES AND BENEFITS

- ▲ Allows huge reduction (7x to 10x) in footprint and weight compared to standard TVS-only or MOV-only protections.
- ▲ Optimal load protection by ensuring the fault current through the load is close to its nominal current (reduced induced fault stress).
- ▲ For long lasting faults, the current decreases over time due to self-heating, thus increasing the level of protection.

DESCRIPTION

The KE12LEB800 is a 8000 mΩ bidirectional Silicon Carbide (SiC) Current Limiting Device that can be used in unidirectional (S1 connected to S2) or bidirectional (device between S1 and S2) modes, designed to clamp the current at a typical value of 1.5A per device, and able to sustain surge transients up to 1200V.

Its elevated ruggedness makes it an ideal device to limit the current through a load when in a fault condition, before the fault disappears or a circuit breaker (mechanical or electronic) may react.

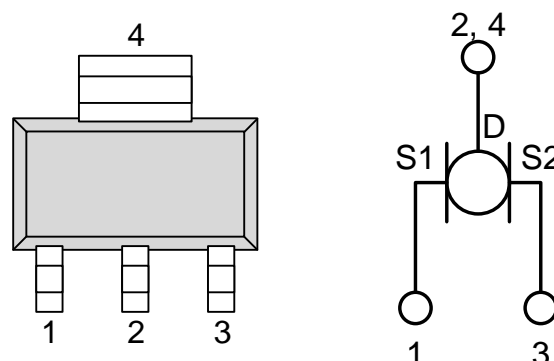
APPLICATIONS

- ▲ Lightning protection
- ▲ Short-circuit / overcurrent protection
- ▲ Overvoltage / surge protection
- ▲ Capacitor pre-charging
- ▲ Resettable fuse
- ▲ Battery protections
- ▲ DC general purpose protection applications
- ▲ Unidirectional current limitation in AC or DC links
- ▲ Photovoltaic power plant protection
- ▲ Constant-current regulation for battery charging or LED driving

KEY PERFORMANCE

Parameter	Value
ON-state Resistance R_{ON}	4.5 Ohms
Nominal Saturation Current $I_{SAT\ NOM}$	1.5 A
Knee Voltage V_{KNEE}	6 V

PACKAGING



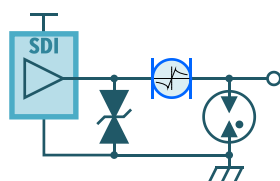
QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE12LEB800S223	SOT-223-3L	KE12LEB800

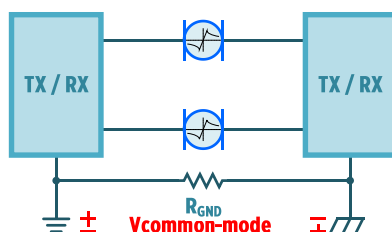
Other packages and packaging configurations possible upon request.

TYPICAL APPLICATION

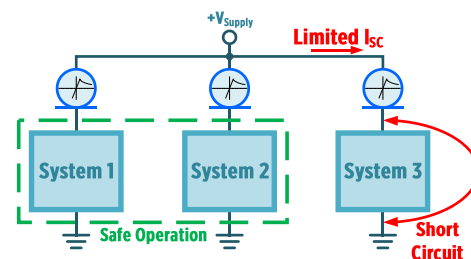
HD-SDI / SDI Surge/Lightning Protection



Data Lines Protection against Common-mode Currents



Protection by Isolating Faulty System



ABSOLUTE MAXIMUM RATINGS

Unless otherwise stated, specification applies for $T_{CASE}=25^{\circ}C$.

Parameter	Symbol	Values	Unit	Note/Test Condition
Maximum Forward Voltage	$V_{DS\ MAX}$	1200	V	Single pulse, $t_{pulse} = 100\mu s$
Maximum Reverse Voltage	$V_{SD\ MAX}$	5	V	Single pulse, $t_{pulse} = 200\mu s$
Maximum DC Forward Voltage	$V_{DS\ MAX\ DC}$	TBD	V	SOT-223 package
Short-circuit time	$t_{SC\ 600V}$	450	μs	$V_{DS} = 600V$

ELECTRICAL CHARACTERISTICS

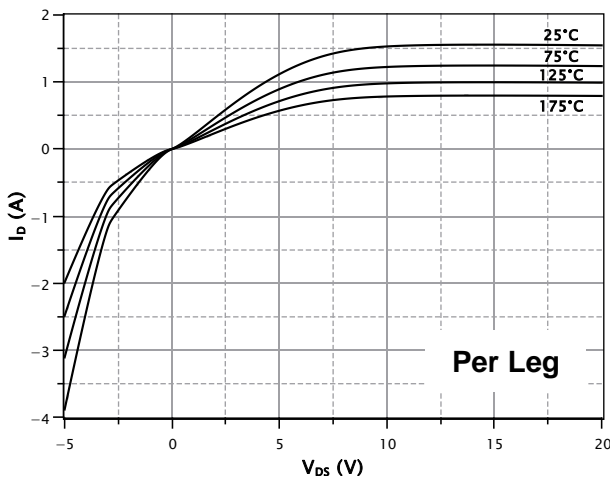
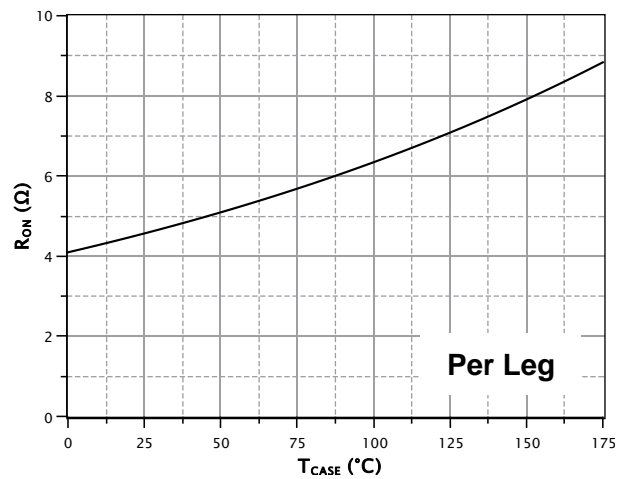
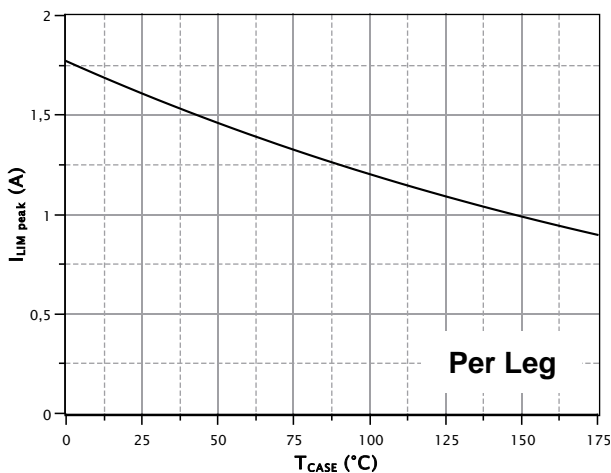
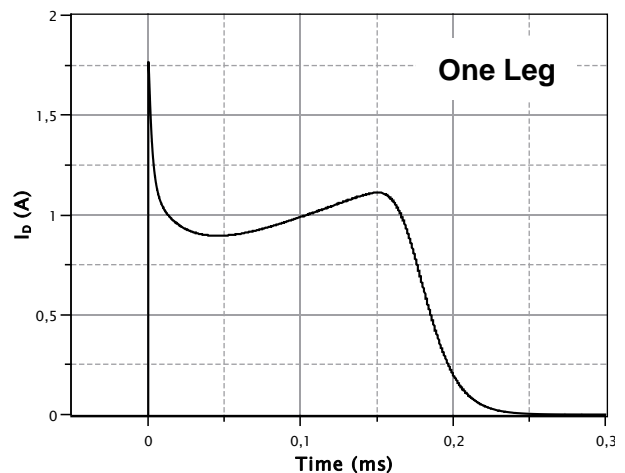
 Unless otherwise stated, specification applies for $T_{CASE}=25^{\circ}C$ and for one leg.

Parameter	Symbol	Values			Unit	Note/Test Condition
		Min	Typ	Max		
ON-state-Resistance	R_{ON}		4.5	7	Ohms	$T_J=25^{\circ}C, V_{DS} = 2V$
			8			$T_J=150^{\circ}C, V_{DS} = 2V$
Maximum recommended Operating DC current	I_{DC}	-0.5		+0.5	A	SOT-223 package
Limiting Current	$I_{LIM\ 1\mu s}$	1.3	1.5	1.8	A	$t_{pulse} = 1\mu s, V_{DS} = 600V, T_{CASE}=25^{\circ}C$
	$I_{LIM\ 10\mu s}$	1	1.1	1.2	A	$t_{pulse} = 10\mu s, V_{DS} = 600V, T_{CASE}=25^{\circ}C$
	$I_{LIM\ 100\mu s}$	0.6	0.7	0.8	A	$t_{pulse} = 100\mu s, V_{DS} = 600V, T_{CASE}=25^{\circ}C$
Operating Junction Temperature	T_J	-55		+175	$^{\circ}C$	
Storage Temperature	T_{STG}	-55		+175	$^{\circ}C$	

THERMAL CHARACTERISTICS

Parameter	Symbol	Values			Unit	Note/Test Condition
		Min	Typ	Max		
Junction-Ambient Thermal Resistance	R_{TH-JA}		TBD		$^{\circ}C/W$	
Junction-Lead Thermal Resistance	R_{TH-JL}		TBD		$^{\circ}C/W$	

TYPICAL PERFORMANCE

 Unless otherwise stated, measurements performed at $T_{CASE}=25^{\circ}C$, and for one device

Fig 1. Pulsed IV curve ($t_{pulse}=200\mu s$) in forward ($V_{DS}>0V$) and reverse ($V_{DS}<0V$) modes, for different T_{CASE} .

Fig 2. ON-state resistance evolution with case temperature at $I_{DC} = 100mA$.

Fig 3. Peak limiting current evolution with case temperature ($t_{pulse} = 10\mu s, V_{DS} = 20V$).

Fig 4. Typical 1.2/50µs, 1000V/500A CLD current response.

DETAILED ORDERING INFORMATION

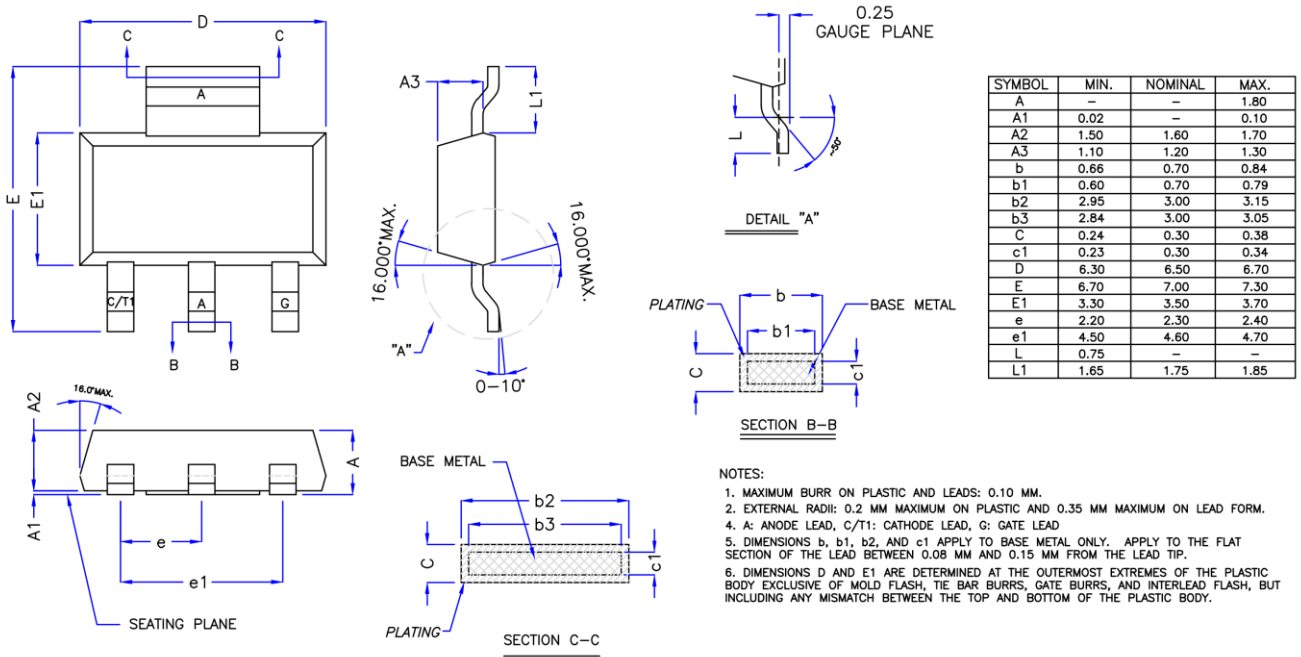
K ↓ Source K = CALY Technologies	E ↓ Temperature range: E = -55°C to +175°C	12 ↓ Rated Voltage: 12 = 1200V	LEB ↓ Device / Type LEB = Current Limiting Device	800 ↓ Rated Resistance: 150 = 1500 mOhm	S223 ↓ Package: S223 = SOT-223-3L
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Part Number	Temperature Range	Package	Pin Count	Marking
KE12LEB800S223	-55°C to +175°C	SOT-223-3L	4	KE12LEB80

Other packages, packaging configurations and finishing materials possible upon request. MOQ may apply.

PACKAGE OUTLINE

SOT-223-3L



Rear Marking:



Unique Lot Assembly Code

YY	Last digits of assembly year (e.g. 9 = 2019).
WW	Assembly week (01 to 52).
A	Assembly location code.
NN	Assembly lot code (01 to 99).

REVISION HISTORY

Revision	Date	Description
1A	2019-Jun-12	Preliminary issue

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