1200V, 600 mOHM, SIC CURRENT LIMITING DEVICE WITH STANDARD 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.
- ▲ Short-circuit capability above 250µs @ 600V, 80µs @ 1200V.
- ▲ Negative temperature coefficient of I_{DS}.
- ▲ Reverse conduction (internal body diode).

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 KE12LS060 is a 600 mΩ Current Limiting Device designed to clamp the forward current at a maximum of 15A and able to sustain surge transients up to 1200V. In reverse mode, the KE12LS060 behaves as a constant resistor.
Its elevated ruggedness makes it an ideal device to limit the current through a load in continuous as well as in fault conditions.

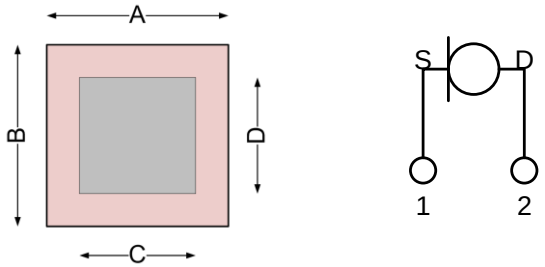
APPLICATIONS

- ▲ 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}	0.6 Ohm
Nominal Saturation Current $I_{SAT\ NOM}$	10 A
Knee Voltage V_{KNEE}	10 V

CHIP OUTLINE



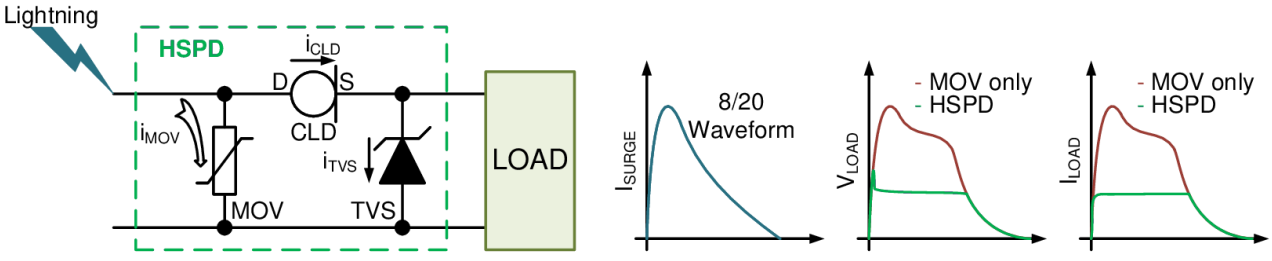
1 : Source on Top Side
2 : Drain on Back Side

QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE12LS060B	Bare die	
KE12LS060SB	SMB (DO214AA)	KE12LS060
KE12LS060T47	TO-247-2	KE12LS060

Other packages and packaging configurations possible upon request.

TYPICAL APPLICATION



ABSOLUTE MAXIMUM RATINGS

Unless otherwise stated, specification applies for T_{CASE}=25°C and assuming a maximum junction-to-case thermal resistance of 1.5°C/W.

Parameter	Symbol	Values	Unit	Note/Test Condition
Maximum DC Dissipated Power	$P_{DC\ MAX}$	100	W	Forward or reverse DC bias
Maximum DC Forward Voltage	$V_{DS\ MAX\ DC}$	12	V	Mounted on TO-247 package
Maximum DC Reverse Voltage	$V_{SD\ MAX\ DC}$	5	V	
Maximum Forward Voltage	$V_{DS\ MAX}$	1200	V	Single pulse, t_{pulse} = 100µs
Maximum Reverse Voltage	$V_{SD\ MAX}$	5	V	Single pulse, t_{pulse} = 200µs
Short-circuit time	$t_{SC\ 600V}$	300	µs	V_{DS} = 600V

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, specification applies for T_{CASE}=25°C and assuming a maximum junction-to-case thermal resistance of 1.5°C/W.

Parameter	Symbol	Values Min	Typ	Max	Unit	Note/Test Condition
ON-state-Resistance	R_{ON}		0.35		Ohm	T_J=25°C
			0.75			T_J=150°C
Maximum recommended Operating DC current	I_{DC}	-7		7	A	Depending upon assembly
Limiting Current	$I_{LIM\ 1\mu s}$	15	20	25	A	t_{pulse} = 1µs, V_{DS} = 600V, T_{CASE}=25°C
	$I_{LIM\ 10\mu s}$	5	7	9	A	t_{pulse} = 10µs, V_{DS} = 600V, T_{CASE}=25°C
	$I_{LIM\ 100\mu s}$	2	4	6	A	t_{pulse} = 100µs, V_{DS} = 600V, T_{CASE}=25°C
Operating Junction Temperature	T_J	-55		+210	°C	Bare die only, depending upon assembly
Storage Temperature	T_{STG}	-55		+175	°C	

TYPICAL PERFORMANCE

Unless otherwise stated, measurements performed at T_{CASE}=25°C and assuming a maximum junction-to-case thermal resistance of 1.5°C/W.

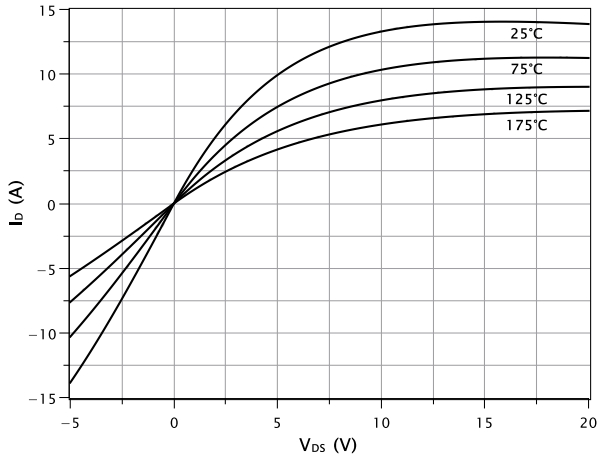


Fig 1. Pulsed IV curve (t_{pulse}=200µs) in forward (VDS>0V) and reverse (VDS<0V) modes, for different T_{CASE}.

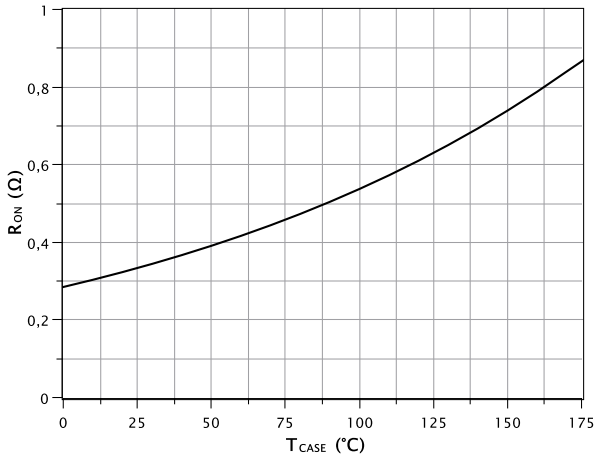


Fig 2. ON-state resistance evolution with case temperature at I_{DC} = 100mA.

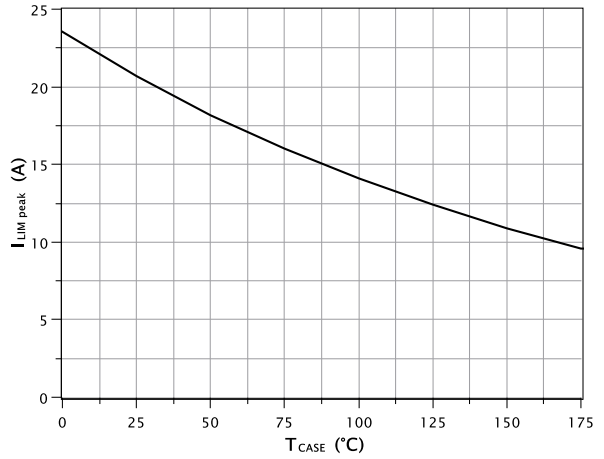


Fig 3. Peak limiting current evolution with case temperature (t_{pulse} = 10µs, V_{DS} = 20V).

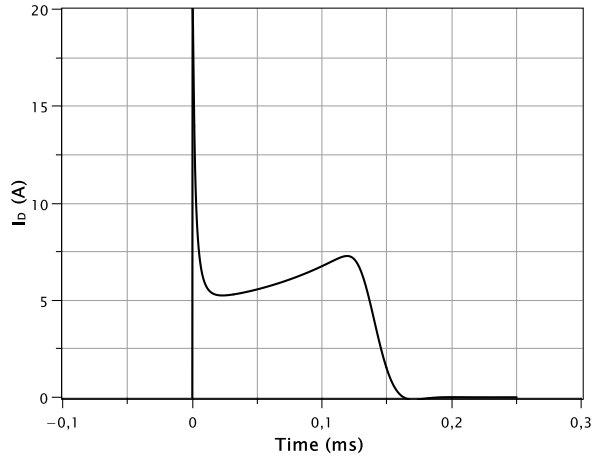


Fig 4. Typical 1.2/50µs, 1000V/500A CLD current response.

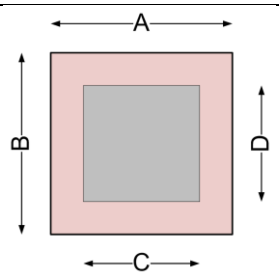
DETAILED ORDERING INFORMATION

K	E	12	LS	060	T
Source K = CALY Technologies	Temperature range: E = -55°C to +175°C	Rated Voltage: 12 = 1200V	Device / Type LS = Current Limiting Device	Rated Resistance: 060 = 600 mOhm	Package: T = TO247

Part Number	Temperature Range	Package	Pin Count	Marking
KE12LS060B	-55°C to +210°C	Bare die		
KE12LS060SB	-55°C to +175°C	SMB (DO214AA)	2	KE12LS060
KE12LS060T47	-55°C to +175°C	TO-247-2	2	KE12LS060

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

BARE DIE INFORMATION



Ref.	Dimensions	
	Millimeters	Inches
A	2.5	0.098
B	2.5	0.098
C	1.6	0.063
D	1.6	0.063
Top	AlCu0.5%	
Bottom	Ti/Ni/Au	

REVISION HISTORY

Revision	Date	Description
1A	2016-Nov-29	First issue
1B	2018-Aug-08	Amended links in Contact Us Section

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For more information on CALY Technologies' products, technical support or ordering:

Website: caly-technologies.com
Email: sales@caly-technologies.com
info@caly-technologies.com

CALY Technologies SAS
CS52132
56 Bd Niels Bohr, Bat CEI2
69603 Villeurbanne Cedex
France