

# CC12H

## High I<sup>2</sup>t Chip fuses



### Product features

- High I<sup>2</sup>t
- High inrush withstand capability
- AEC-Q200 qualified: (750 mA to 30 A)
- Excellent temperature and cycling characteristics
- 1206 (3216 metric) compact design utilizes less board space
- Compatible with solder reflow and wave solder

### Environmental compliance



### Applications

Secondary circuit protection

- Laptop, notebook, netbook
- Tablets, e-readers
- Flat panel displays
- High definition television (HDTV)
- LCD/LED backlighting
- Computers and peripherals
- Gaming console systems
- Handheld/portable equipment
- Mobile device chargers

Automotive

- Central body control module
- Heating ventilation and air conditioning controllers (HVAC)
- Doors, window lift and seat control
- Digital instrument cluster
- In-vehicle infotainment (IVI) and navigation
- Electric pumps, motor control and auxiliaries
- Powertrain control module (PCU)/Engine Control unit (ECU)
- Transmission Control Unit (TCU)

### Agency information

- cURus Recognition: File E19180, Guide JDYX2/JDYX8
- AEC-Q200 qualified (750 mA to 30 A)

### Ordering

- Use ordering number (see page 6 for details)

### Packaging suffixes

- -TR (3000 parts per 7" diameter reel, tape width 8 mm)

## Electrical characteristics

Amp rating	Amp rating condition	Opening time
250 mA – 30 A	100%	4 hours minimum
1 A – 3 A	200%	1.0 s – 60 s
1 A – 5 A	250%	5 s max
1 A - 5 A	300%	0.1 - 3.0 s
250 mA – 750 mA	350%	5 s max
6 A - 30 A	350%	5 s max

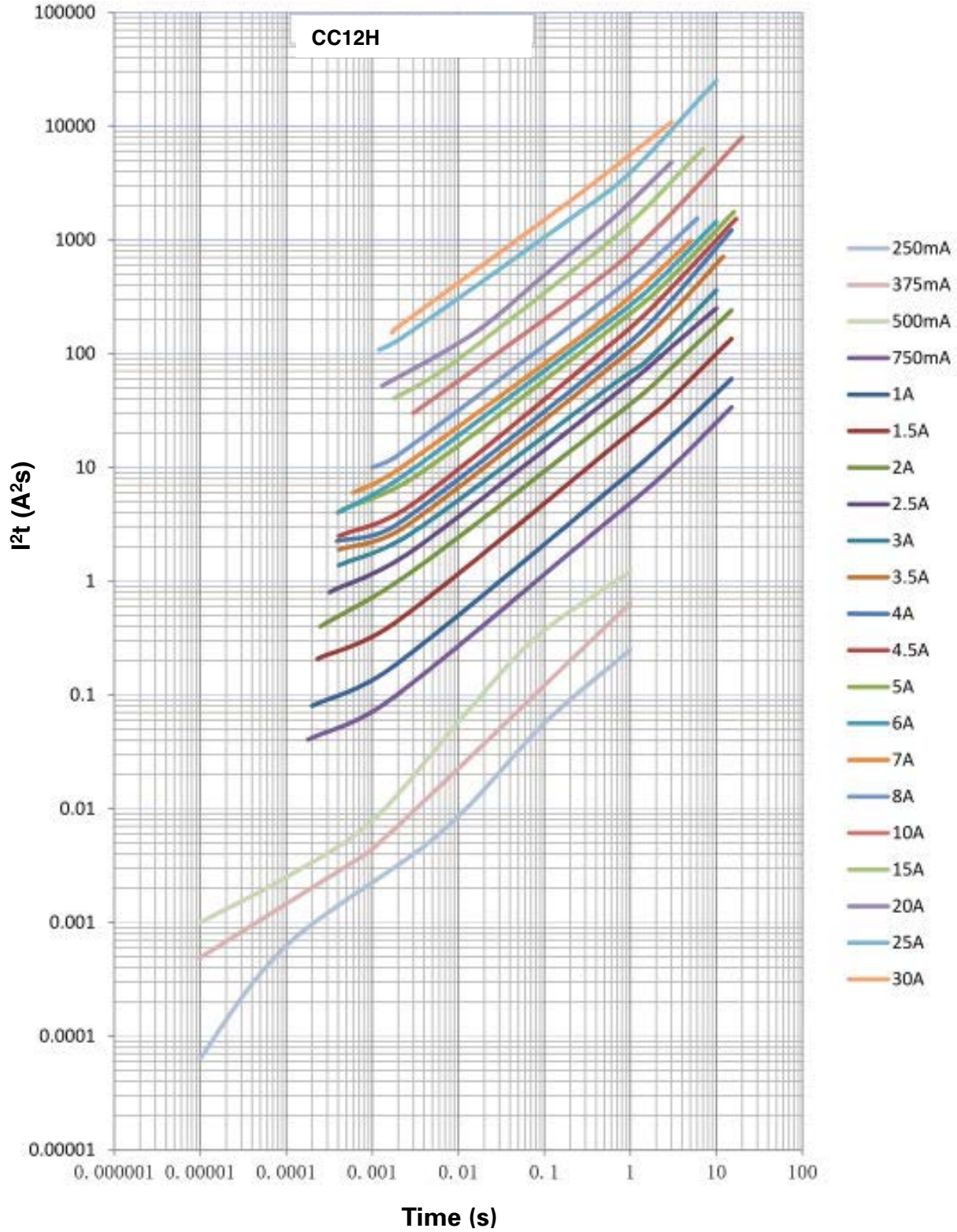
## Product specifications

Part number	Current rating (A)	Voltage rating (V <sub>dc</sub> )	Interrupting rating <sup>1</sup> (A)	Typical DC cold resistance <sup>2</sup> (mΩ)	Typical pre-arcing <sup>3</sup> I <sup>2</sup> t (A <sup>2</sup> s)	Typical voltage drop (mV)	Part marking
CC12H250mA	0.25	63	50	3500	0.00038	1400	.25
CC12H375mA	0.375	63	50	1750	0.00077	730	A
CC12H500mA	0.5	63	50	980	0.0019	700	0.5
CC12H750mA	0.75	63	50	800	0.15	700	E
CC12H1A	1	63	50	470	0.18	490	H
CC12H1.5A	1.5	63	50	218	0.4	355	K
CC12H2A	2	63	50	133	1.1	305	N
CC12H2.5A	2.5	63	50	79	1.7	240	O
CC12H3A	3	63	50	49	2.2	185	P
CC12H3.5A	3.5	63	50	37	2.7	180	R
CC12H4A	4	63	50	33	3.2	169	S
CC12H4.5A	4.5	32	100	28	4.2	160	X
CC12H5A	5	32	100	23	6	140	T
CC12H6A	6	32	100	15.5	12	150	F
CC12H7A	7	32	100	11.5	18	130	J
CC12H8A	8	32	100	7.3	18	110	V
CC12H10A	10	32	100	6.5	30	90	U
CC12H12A	12	32	100	4.7	45	90	W
CC12H15A	15	32	100	3	57	90	Y
CC12H20A	20	32	100	2	80	90	Q
CC12H25A	25	32/48	200/150	3	60	90	L
CC12H30A	30	32/48	200/150	2.1	100	90	Z

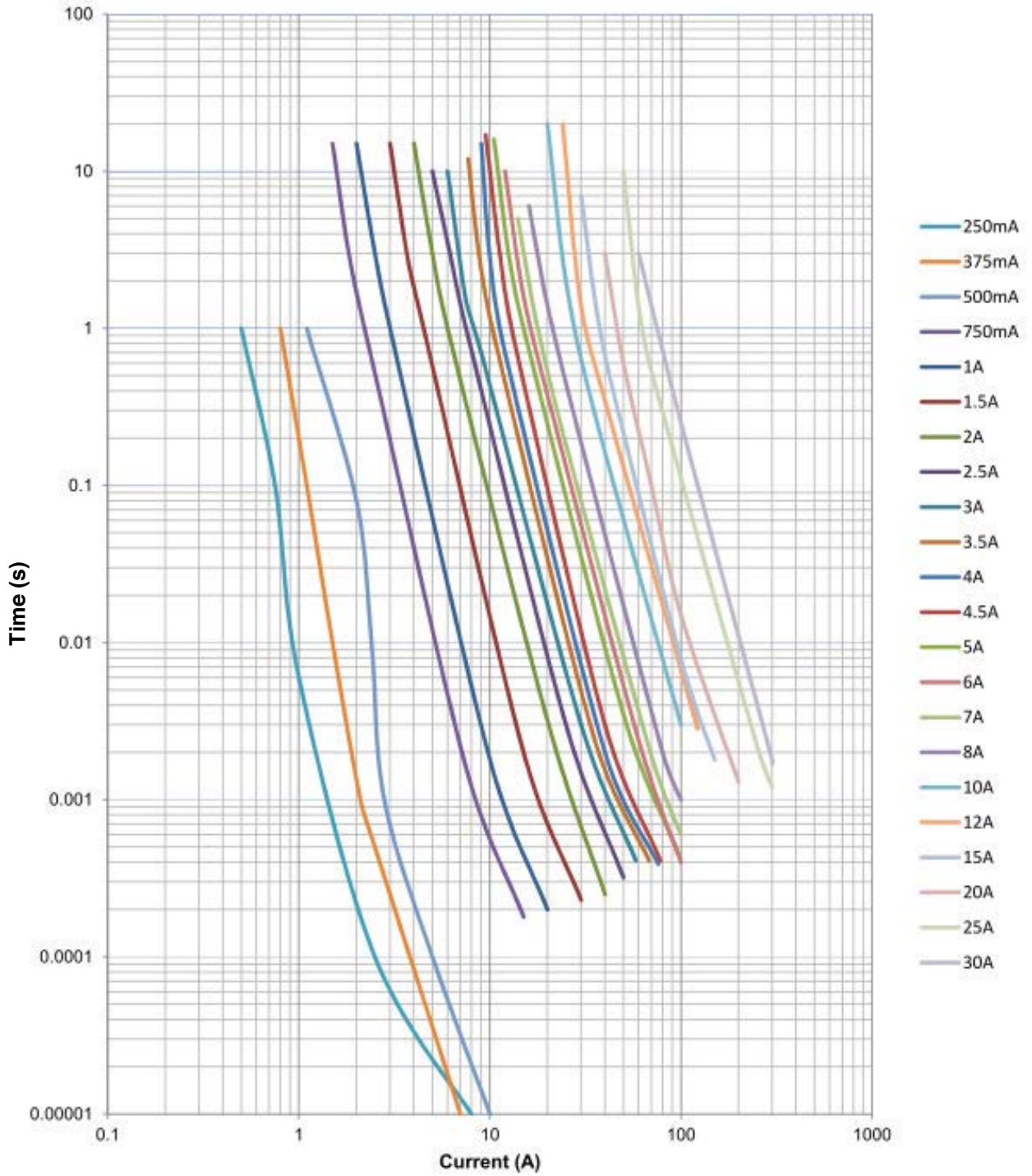
1. DC interrupting rating measured at rated voltage, time constant of less than 50 microseconds, battery source.
2. Typical DC cold resistance measured at <10% of rated current.
3. Typical pre-arcing I<sup>2</sup>t value is measured at 10In rated current.



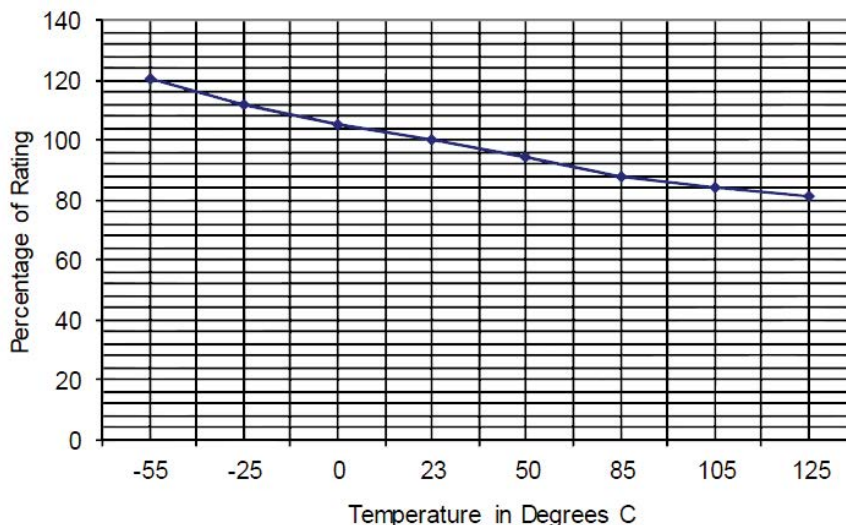
I<sup>2</sup>t vs. time curve



Time vs. current curve



### Temperature derating curve



### General specifications

Operating temperature: -55 °C to +125 °C (with derating)

Thermal shock: MIL-STD-202G, Method 107, (300 cycles -55 °C to +125 °C)

Vibration: MIL-STD-202G, Method 204, (20 g's for 20 minutes, 12 cycles in each of 3 orientations, 10- 2000 Hz)

Humidity: MIL-STD-202G, Method 103, (+85 °C, 85% relative humidity, 1000 hours 10% of operating power)

Mechanical shock: MIL-STD-202G, Method 213, Condition C

### Ordering codes

The ordering code is the part number replacing the “.” with a “-” plus adding the packaging suffix.

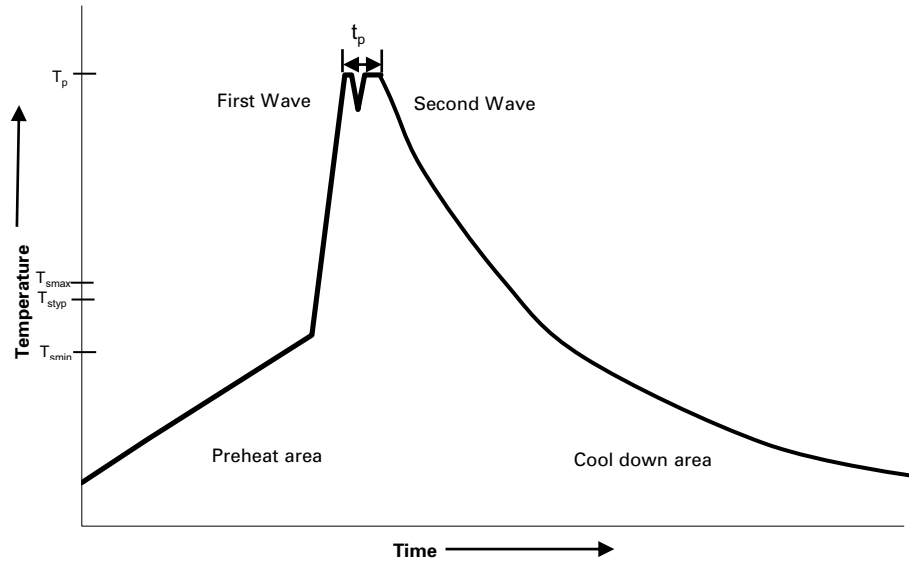
### Packaging suffix

- -TR (3000 parts on a 7” reel, tape width 8 mm).

Part number	Ordering code
	-TR option
CC12H250mA	CC12H250mA-TR
CC12H375mA	CC12H375mA-TR
CC12H500mA	CC12H500mA-TR
CC12H750mA	CC12H750mA-TR
CC12H1A	CC12H1A-TR
CC12H1.5A	CC12H1.5A-TR
CC12H2A	CC12H2A-TR
CC12H2.5A	CC12H2.5A-TR
CC12H3A	CC12H3A-TR
CC12H3.5A	CC12H3.5A-TR

Part number	Ordering code
	-TR option
CC12H4A	CC12H4A-TR
CC12H4.5A	CC12H4.5A-TR
CC12H5A	CC12H5A-TR
CC12H6A	CC12H6A-TR
CC12H7A	CC12H7A-TR
CC12H8A	CC12H8A-TR
CC12H10A	CC12H10A-TR
CC12H12A	CC12H12A-TR
CC12H15A	CC12H15A-TR
CC12H20A	CC12H20A-TR
CC12H25A	CC12H25A-TR
CC12H30A	CC12H30A-TR

**Wave solder profile**



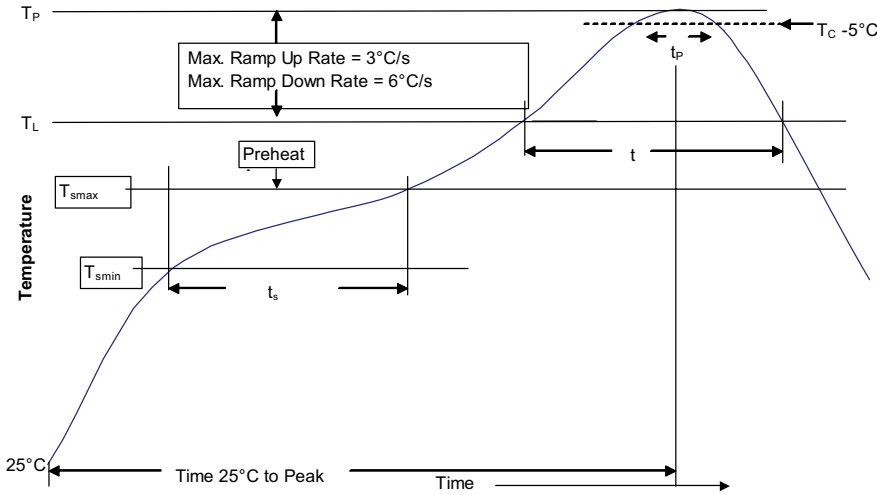
**Reference EN 61760-1:2006**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat		
• Temperature min. ( $T_{smin}$ )	100 °C	100 °C
• Temperature typ. ( $T_{styp}$ )	120 °C	120 °C
• Temperature max. ( $T_{smax}$ )	130 °C	130 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	70 seconds	70 seconds
$\Delta$ preheat to max Temperature	150 °C max.	150 °C max.
Peak temperature ( $T_p$ )*	235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature ( $t_p$ )	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C	4 minutes	4 minutes

**Manual solder**

+350 °C (4-5 seconds by soldering iron), generally manual/hand soldering is not recommended.

**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

**Table 2 - Lead (Pb) free solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

**Reference J-STD-020**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	<ul style="list-style-type: none"> <li>Temperature min. (T<sub>smin</sub>)</li> <li>Temperature max. (T<sub>smax</sub>)</li> <li>Time (T<sub>smin</sub> to T<sub>smax</sub>) (t<sub>s</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>100 °C</li> <li>150 °C</li> <li>60-120 seconds</li> </ul>
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> ) Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	<ul style="list-style-type: none"> <li>183 °C</li> <li>60-150 seconds</li> </ul>	<ul style="list-style-type: none"> <li>217 °C</li> <li>60-150 seconds</li> </ul>
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	30 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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