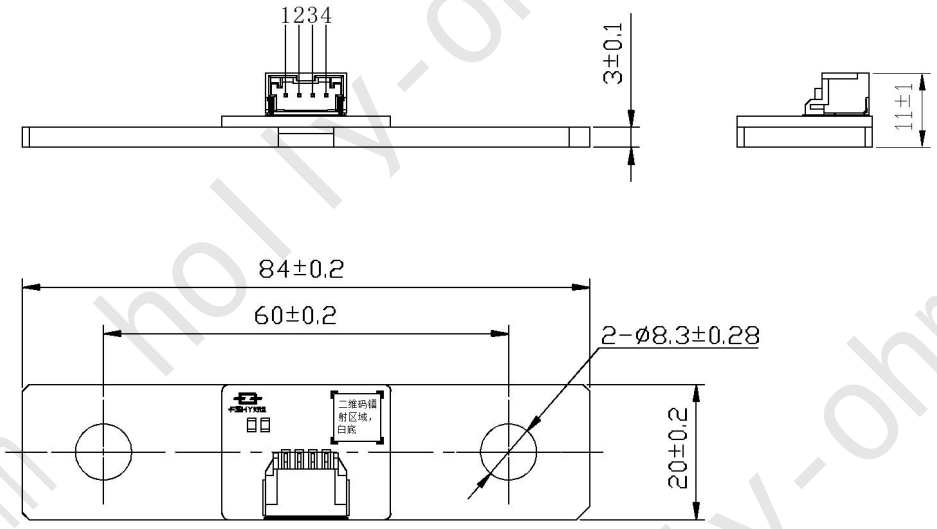
PCBA Type Shunt

For high current signal sampling，ultra-low resistance value，high power shunt
AEC-Q200 qualified，high stability，ultra-low thermal EMF and TCR

Features:

- PCBA type shunt resistor with high temperature resistance automotive-grade connector for voltage sampling
- built-in NTC Temperature Sensor ,real-time temperature output,can be used for temperature control or thermal drift compensation
- continuous load current can up to 600A
- the shunt's copper terminals plates with nickel and tin,which prevents oxidation and ensures better electrical connections.
- RoHS compliant
- customization

Dimensions

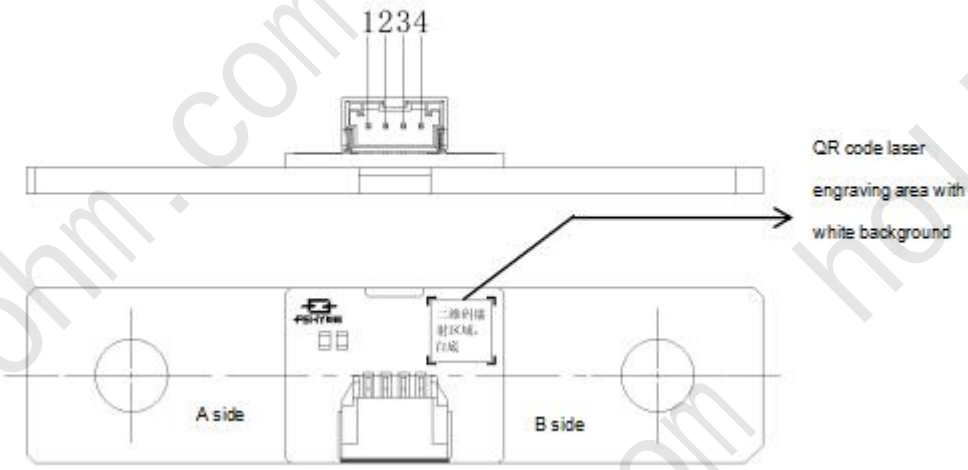


Type Designation(example): PACS8420 L100J00 PACS8420 0.1mohm 5% standard

P	A	C	S	8	4	2	0	L	1	0	0	J	0	0

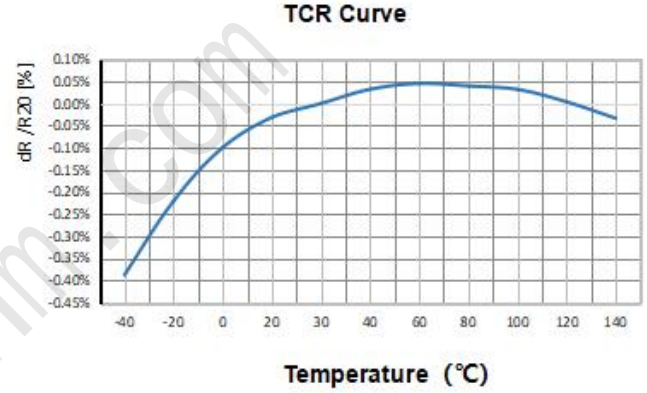
PACS	Size	Resistance value	Tolerance	Code
PCBA type shunt	8420	L100 = 0.1mΩ	J=±5%	00: standard XX: customization (01~99)

definition of pin for pcba type shunt:

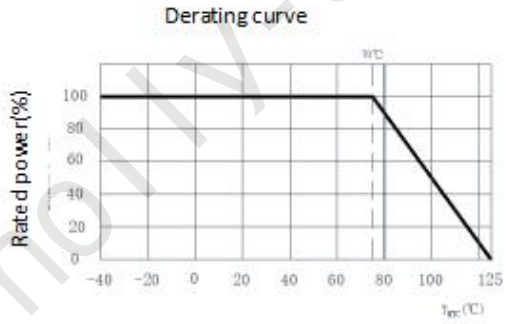


Pin	Definition
1	connect Pin 1 with NTC, used for temperature detection
2	connect Pin 2 with A side CS1, used for current detection
3	connect Pin 3 with B side CS1, used for current detection
4	connect Pin 4 with NTC, used for temperature detection
Capacitors_C1	TDK_CGA4J2X8R1H104K125AA_automotive-grade
NTC thermistor_R1	NTC Thermistor: VISHAY_NTCS0805E3103HMT_automotive-grade(alternative: TCT6G_H103H357V)
Connector	Molex_502352-0400(DuraClik)
Conformal Coating	Dymax 9483

TCR curve:



Derating Curve:



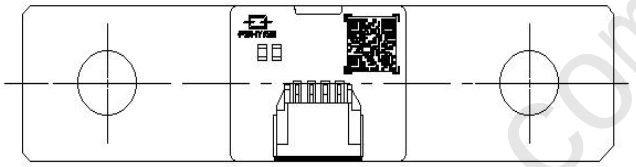
parameter	Value and

	units
shunt	
resistance value	100μΩ
tolerance	5%
TCR	±75ppm/℃
temperature range	-40℃~+125℃
rated power ($P_{70°}$)	36W
thermal EMF (EMF)	1μV/℃
inductance	< 5nH
NTC (automotive-grade)	
resistance value at 25° C	10kΩ
tolerance for R25	3%
B25/85	3570 K
tolerance for B25/85	3%
operating temperature range	-40℃~+150℃
CAP (X8R, automotive-grade)	
Nominal Capacitance	0.1μF
Capacitance Tolerance	10%
DC rated voltage	100V
Operating Temperature Range	-40℃~+125℃

Performance:		
Test Item	**standard**	**Test method**
TCR	Within specified TCR	IEC60115-1 4.8，measured point-40°C~+140°C，reference point+20°C
Resistance to soldering heat	No visible damage △R±0.5% Maximum	IEC60115-1 4.18，260°C tin bath，10s
load life	No visible damage △R±1.0% Maximum	IEC 60115-1 4.25.1，1000hrs.， 70°C±2°C，rated current, or the maximum current rating of the component (whichever is lower) is applied for 1.5 hours/0.5 hour interruption
High temp. & high humidity	No visible damage △R±1% Maximum	Applying 10% of the rated power (current) or the limiting current of the component (whichever is lower) for a duration of 1000 hours in a temperature of 85°C and a humidity of 85% according to MIL-STD-202 method 103
temperature cycle	No visible damage △R±1% Maximum	IEC60115-1 4.19， -55°C@30mins~+125°C@30mins；1000cycles
High temperature storage	No visible damage △R±1% Maximum	IEC60115-1 4.25.3， 1000小时@125°C，without loading current and voltage
Low temperature	No visible damage △R±0.5%Maximum	IEC60115-1 4.36，cooled from room temperature to -55°C ,no load for 1.5 hours,applying rated power,continuously flowing for 45 minutes,cool for 15

load		minutes，then recover to room temperature for testing again.
vibration	No visible damage △R≤±0.5% Maximum	MIL-STD-202 Method 204， peak acceleration：5g（gravity acceleration）， frequency varied： (10~2000Hz) test direction：X、Y、Z direction，12 cycles in each direction ， ，each cycle 20min，total about 12h
Impact test	No visible damage △R≤±0.5% Maximum	MIL-STD-202 Method 213 Impact acceleration：100g(gravity acceleration) Impact pulse width：6ms Impact waveform：half sine wave Impact direction：±X, ±Y, and ±Z directions each 3 times

QR code rule:



QR code content	Production Date	series no.	resistance value R25	second-order coefficient	first-order coefficient	constant term coefficient
	20230614	00001	R100123n	-0.000000323	+0.000053690	+0.998684582
explanation	14Jun2023	00001~99999	100123nΩ	-0.000000323	+0.000053690	+0.998684582
20230614000001R100123n-0.000000323+0.000053690+0.998684582						
remark	R25 is resistance value of shunt at 25 ℃ （units：nΩ）					

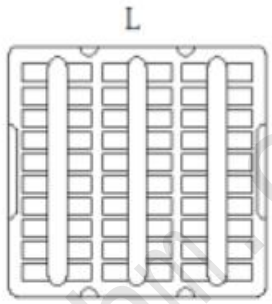
notice: generic compensation factor, the resistance of shunt need to be multiplied with:

Rcomp = A*T^2 + B*T +C

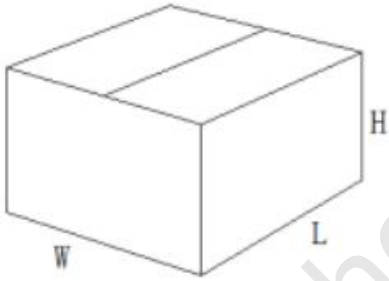
where:

- **Rcomp is the compensation factor for Shunt resistance drift over ambience temperature normalized to 1 at 25 ℃**
- **T is temperature reading from PCB temperature sensor NTC**
- **A is quadratic coefficient， the default value is-0.000000323***
- **B is first-order coefficient，the default value is+0.000053690***
- **C is constant term coefficient ， the default value is+0.998684582***
- **The compensated shunt resistance value = R25 * Rcomp**
- **R25 is resistance value of shunt at 25 ℃**
- ***value is for reference only.**

Specifications and measurements of the packaging(units:mm)



tray



carton

specification	pieces/layers	L (mm)	W (mm)	H (mm)
tray	30pcs	350	350	15
carton	9 layers	360	360	150

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version update record

Version NO.	update record	person in charge	Issue date
A0	updated version release	Fameng Hong	16May2022
A1	add QR code content	Fameng Hong	30Mar2023
A2	update testing content	Fameng Hong	06Sep2023