

描述 / Descriptions

SOP-8 塑封封装 带精密电压基准的双通道运算放大器。

BROP4358SC 是一款专门设计用于在电池充电器和开关电源应用上调节输出电流和电压的集成电路。器件内部包含了两个运算放大器和一个 2.5V 的精密基准电压。运放 1 的同相输入端与电压基准调节器的输出端相连，用于控制电压；运放 2 的输入端内部是无连接的，用于控制电流。在电源管理和数据采集系统等应用中，该器件的使用节省了空间和成本。

Dual Operational Amplifier and Voltage Reference in a SOP-8 Plastic Package.

The BROP4358SC is a monolithic IC specifically designed to regulate the output current and voltage levels of battery chargers and switching power supplies. The device contains two Op Amps and a 2.5V precision shunt voltage reference. Op Amp 1 is designed for voltage control with its non-inverting input internally connects to the output of the shunt regulator. Op Amp 2 is for current control with both inputs uncommitted. This device is offering space and cost saving in many applications like power supply management or data acquisition systems.

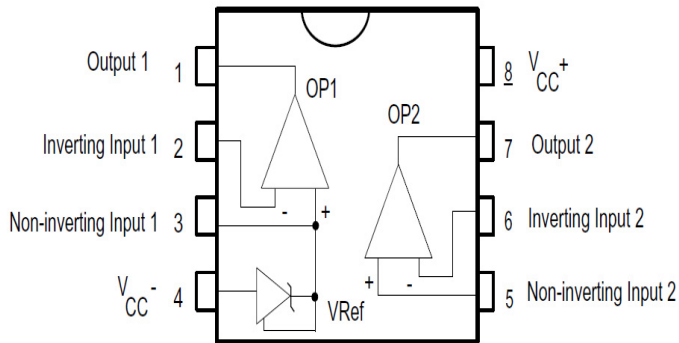
特征 / Features

- ◆ 工作电压范围宽 ($V_{CC} = 3V \sim 36V$)。
- ◆ 输出电压范围大 ($0 \sim V_{CC} - 1.5V$)。
- ◆ 输入共模电压接近地电平。
- ◆ 固定输出基准电压 2.5V，精度 $\pm 0.4\%$ 和 $\pm 0.8\%$ 。
- ◆ 阴极电流能力：1~100mA。
- ◆ 典型输出电阻：0.15 Ω 。
- ◆ Wide operating supply range ($V_{CC} = 3V \sim 36V$).
- ◆ Large output voltage swing: 0 to ($V_{CC} - 1.5V$).
- ◆ Input common mode voltage includes ground.
- ◆ Fixed output Voltage reference: 2.5V, voltage tolerance: $\pm 0.4\%$ and $\pm 0.8\%$.
- ◆ Sink current capability: 1 to 100mA.
- ◆ Typical output impedance: 0.15 Ω .

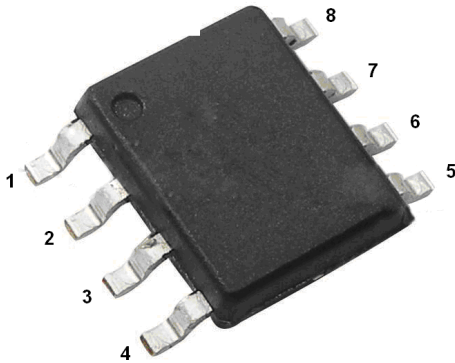
用途 / Applications

- ◆ 电池充电器。
- ◆ AC/DC适配器。
- ◆ LED照明。
- ◆ Battery charger.
- ◆ AC/DC power adapter.
- ◆ LED lightings.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 见内部等效电路 / PIN See Equivalent Circuit.

印章代码 / Marking

见印章说明 / See Marking Instructions

极限参数 / Absolute Maximum Ratings(Ta=25°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Supply Voltage	V_{CC}	36	V
Differential input voltage	$V_{I(DIFF)}$	36	V
Input Voltage	V_I	-0.3 to +36	V
Operating Temperature	T_{opr}	-40 to +125	°C
Maximum Junction Temperature	T_J	150	°C

电性能参数 / Electrical Characteristics(Ta=25°C) (V_{CC}⁺ = +5V, V_{CC} = Ground ,Vo = 1.4V)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Supply Current	I _{CC}	V _{CC} =5V		0.5	1.2	mA
		V _{CC} =30V		0.8	2.0	mA
Operator2(independent op-amp)						
Input offset voltage	V _{IO}	V _{cm} =0 to V _{CC} -1.5 V _o (p)=1.4V R _s =0		1	3	mV
Input Offset Voltage Drift	D _{Vio}	T _{min} ≤ T _{amb} ≤ T _{max}		7		Uv/°C
Input offset current	I _{IO}	Ta=25°C		2.0	30	nA
Input Bias current	I _{BIAS}	Ta=25°C		45	100	nA
Large signal Voltage Gain	A _{vd}	V _{CC} =15V R _L =2kΩ V _o = 1.4V to 11.4V	25	100		V/mV
Supply Voltage Rejection Ratio	SVR	V _{CC} = 5V to 30V	65	100		dB
Input Common Mode Voltage Range	V _{icm}	V _{CC} = +30V - see note ¹⁾	0		(V _{CC} ⁺) -1.5	V
Common mode rejection Ratio	CMR	Ta=25°C	70	85		dB
Output Current Source	I _{source}	V _{CC} = +15V V _o = 2V V _{id} = +1V	20	40		mA
Short Circuit to Ground	I _{SC}	V _{CC} = +15V		40	60	mA
Output Current Sink	I _{sink}	V _{CC} = +15V V _o = 2V V _{id} = -1V	10	13		mA
High Level Output Voltage	V _{OH}	V _{CC} +30V T _{amb} =25°C R _L =10kΩ	27	28		V
Low Level Output Voltage	V _{OL}	R _L = 10k		5	20	mV
Slew Rate at Unity Gain	SR	V _i = 0.5 to 3V V _{CC} =15V R _L = 2kΩ C _L =100pF unity gain	0.2	0.4		V/μS
Gain Bandwidth Product	GBP	V _{CC} = 30V R _L =2kΩ C _L =100pF f=100kHz V _{in} =10mV	0.5	0.9		MHz
Total Harmonic Distortion	THD	f=1kHz A _v =20dB R _L =2kΩ V _{CC} =30V C _L =100pF V _o =2V _{pp}		0.02		%

电性能参数 / Electrical Characteristics(Ta=25°C) (V_{CC}⁺ = +5V, V_{CC} = Ground ,Vo = 1.4V)

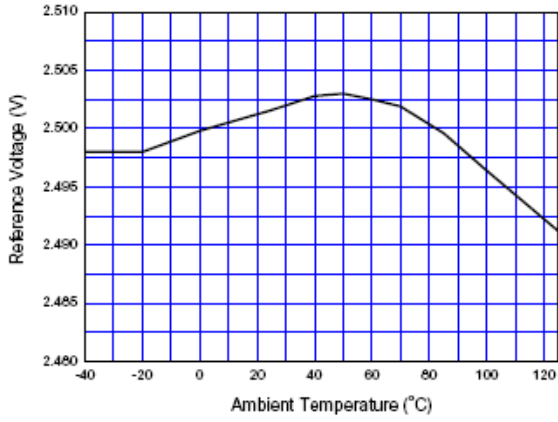
Operator 1 (op-amp with non-inverting input connected to the internal Vref)						
Input offset voltage	V _{IO}	V _{cm} =0 to V _{CC} -1.5 V _o (p)=1.4V R _s =0		1	3	mV
Input Offset Voltage Drift	D _{Vio}	T _{min} ≤ T _{amb} ≤ T _{max}		7		Uv/ °C
Input Bias current	I _{BIAS}	Ta=25°C		45	100	nA
Large signal Voltage Gain	Avd	V _{CC} =15V RL=2kΩ V _o = 1.4V to 11.4V	25	100		V/mV
Supply Voltage Rejection Ratio	SVR	V _{CC} = 5V to 30V	65	100		dB
Output Current Source	I _{source}	V _{CC} = +15V V _o = 2V V _{id} = +1V	20	40		mA
Short Circuit to Ground	I _{SC}	V _{CC} = +15V		40	60	mA
Output Current Sink	I _{sink}	V _{CC} = +15V V _o = 2V V _{id} = -1V,	10	13		mA
High Level Output Voltage	V _{OH}	V _{CC} ⁺ =30V T _{amb} = 25°C R _L =10kΩ	27	28		V
Low Level Output Voltage	V _{OL}	R _L = 10k		5	20	mV
Slew Rate at Unity Gain	SR	V _i = 0.5 to 3V V _{CC} =15V R _L = 2kΩ C _L =100pF unity gain	0.2	0.4		V/μS
Gain Bandwidth Product	GBP	V _{CC} = 30V R _L =2kΩ C _L =100pF f=100kHz V _{in} =10mV	0.5	0.9		MHz
Total Harmonic Distortion	THD	f = 1kHz A _v = 20dB R _L =2kΩ V _{CC} = 30V C _L =100pF V _o =2V _{pp}		0.02		%
Voltage Reference						
Reference Input Voltage	Vref	VKA=VREF IK=10mA(A=0.4%)	2.49	2.5	2.51	V
		VKA=VREF IK=10mA(B=0.8%)	2.48	2.5	2.52	V
Reference Input Voltage Deviation Over Temperature Range	ΔVref	VKA = Vref Ik=10mA T _{min} ≤ T _{amb} ≤ T _{max}		7	30	mV
Minimum Cathode Current for Regulation	I _{k(min)}	VKA = Vref		0.4	1	mA
Dynamic Impedance - note ²⁾	ZKA	VKA = Vref IK = 1 to 100mA f < 1kHz		0.15	0.5	Ω

1. The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V. The upper end of the common-mode voltage range is V_{CC}⁺ - 1.5V.

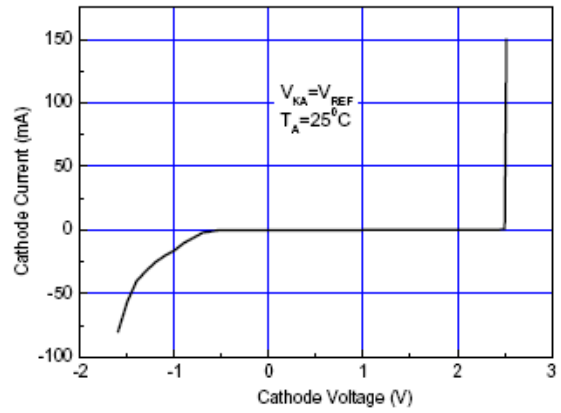
But either of both inputs can go to +36V without damage.

2.The dynamic impedance is defined as |ZKA| = ΔVKA/ΔIK.

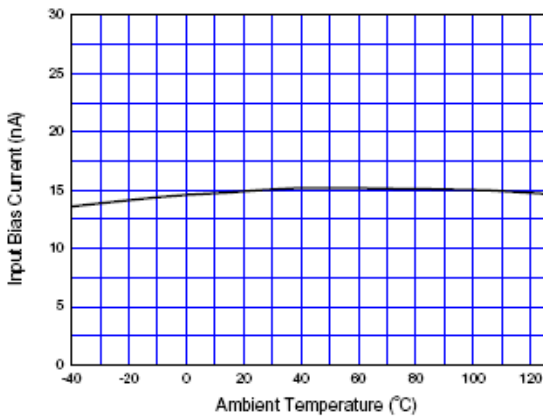
电参数曲线图 / Electrical Characteristic Curve



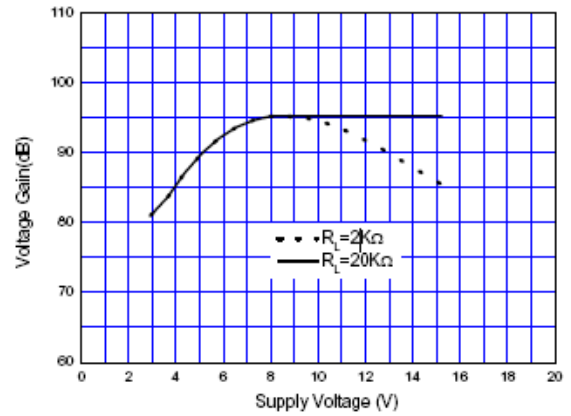
Reference Voltage vs. Ambient Temperature



Cathode Current vs. Cathode Voltage

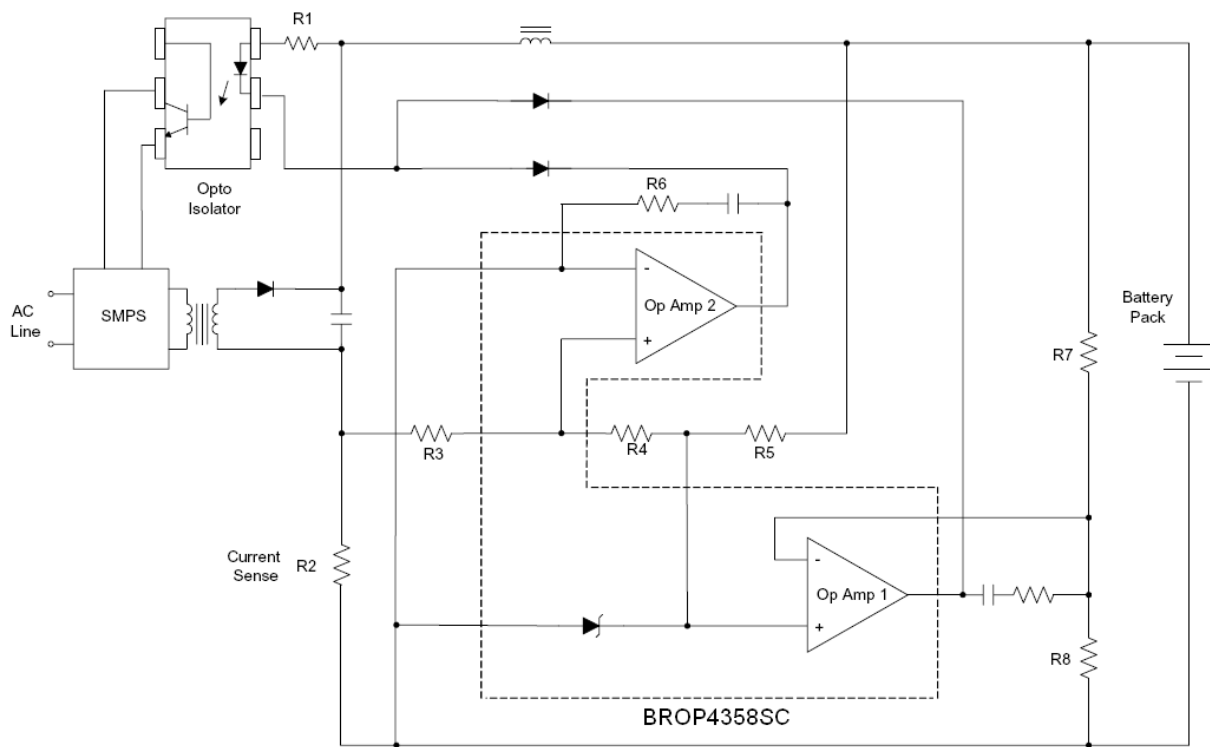


Input Bias Current vs. Ambient Temperature



Op Amp Voltage Gain

典型应用 / Typical Application

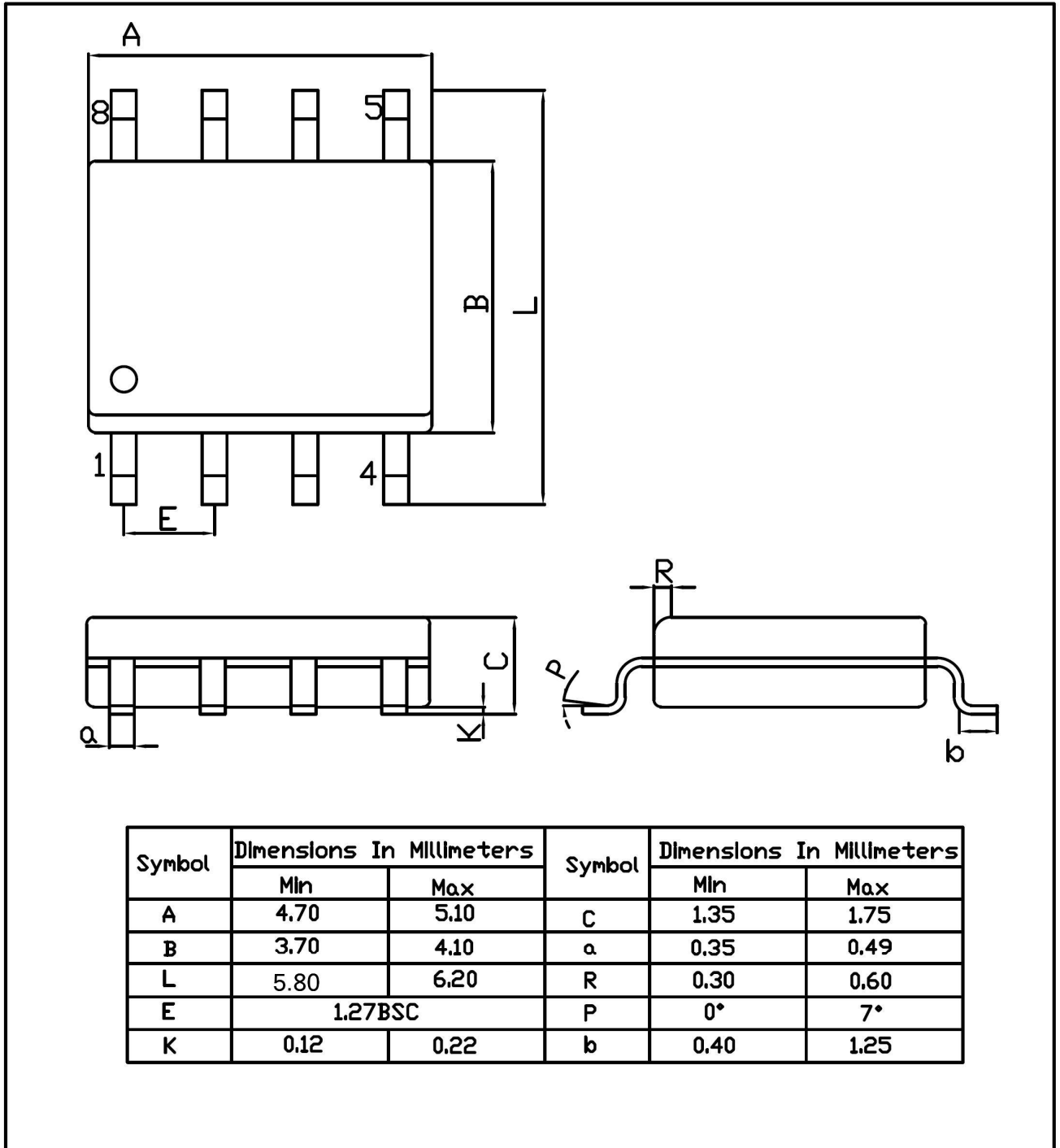


Application of BROP4358SC in a Constant Current and Constant Voltage Charger

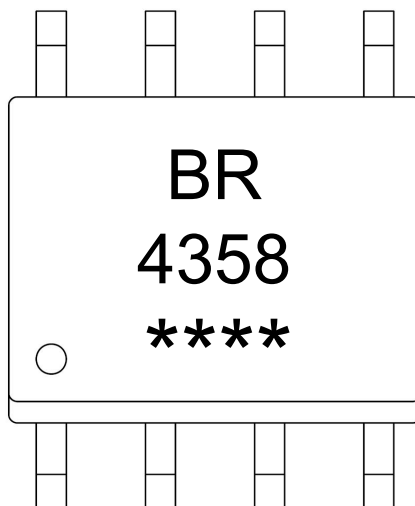
外形尺寸图 / Package Dimensions

SOP-8

Unit:mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

4358： 为型号代码

****： 为生产批号代码，随生产批号变化

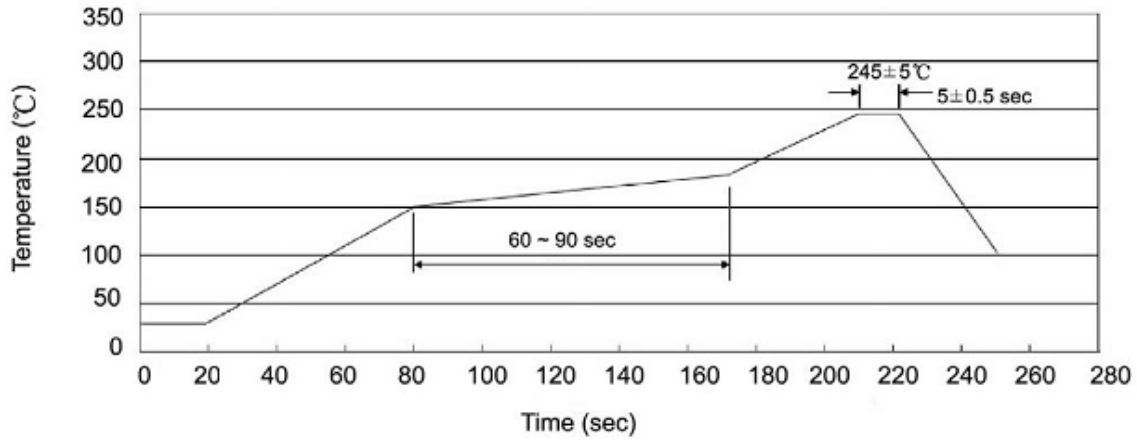
Note:

BR: Company Code.

4358: Product Type.

****: Lot No. Code, code change with Lot No.

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



说明：

- 1、预热温度 150 ~ 180°C，时间 60 ~ 90sec；
- 2、峰值温度 245±5°C，时间持续为 5±0.5sec；
- 3、焊接制程冷却速度为 2 ~ 10°C/sec.

Note:

- 1.Preheating:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOP/ESOP-8	4,000	2	8,000	6	48,000	13" ×12	360×360×50	380×335×366

使用说明 / Notices