NCE N-Channel Enhancement Mode Power MOSFET

Description

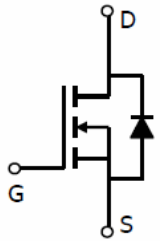
The NCE0108AS uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

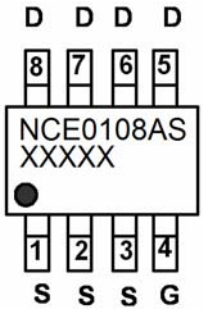
- V_{DS} = 100V,I_D =8A
  $R_{DS(ON)}$ < 28mΩ @ V_{GS}=10V (Typ:22mΩ)
- Special process technology for high ESD capability
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current

Application

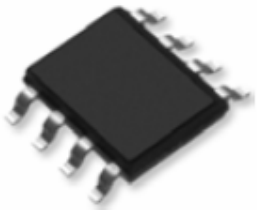
- DC/DC Primary Side Switch
- Telecom/Server
- Synchronous Rectification



Schematic diagram



Marking and pin assignment



SOP-8 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
NCE0108AS	NCE0108AS	SOP-8	Ø330mm	12mm	4000 units

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	8	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	5.6	A
Pulsed Drain Current(Note 1)	I_{DM}	57	A
Maximum Power Dissipation	P_D	2.6	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	48	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

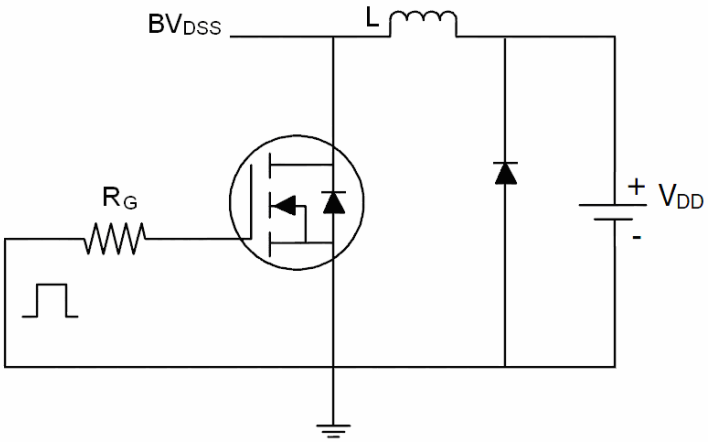
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	110	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.3	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A	-	22	28	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=8A	20	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	2479	-	PF
Output Capacitance	C_{oss}		-	96	-	PF
Reverse Transfer Capacitance	C_{rss}		-	79	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V,I_D=10A,R_L=5Ω, R_G=1Ω,V_{GS}=10V	-	9	-	nS
Turn-on Rise Time	t_r		-	9	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	32	-	nS
Turn-Off Fall Time	t_f		-	8	-	nS
Total Gate Charge	Q_g	I_D=10A,V_{DD}=50V,V_{GS}=10V	-	67.2	-	nC
Gate-Source Charge	Q_{gs}		-	9.4	-	nC
Gate-Drain Charge	Q_{gd}		-	15.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=8A	-	0.85	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	8	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 8A di/dt = 100A/μs (Note3)	-	30		nS
Reverse Recovery Charge	Qrr		-	44		nC

Notes:

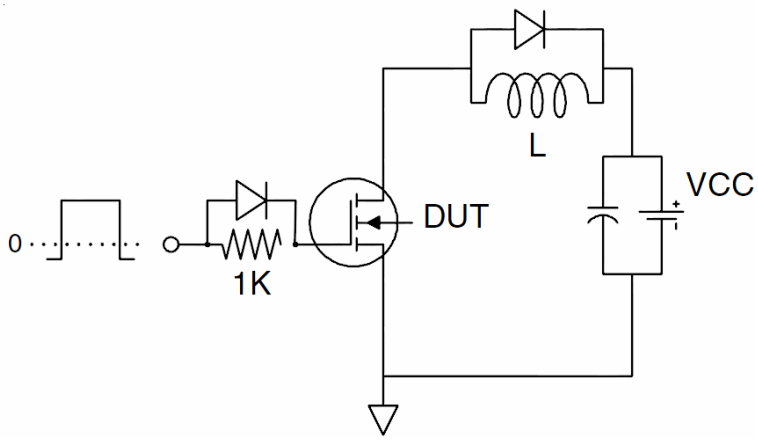
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Test Circuit

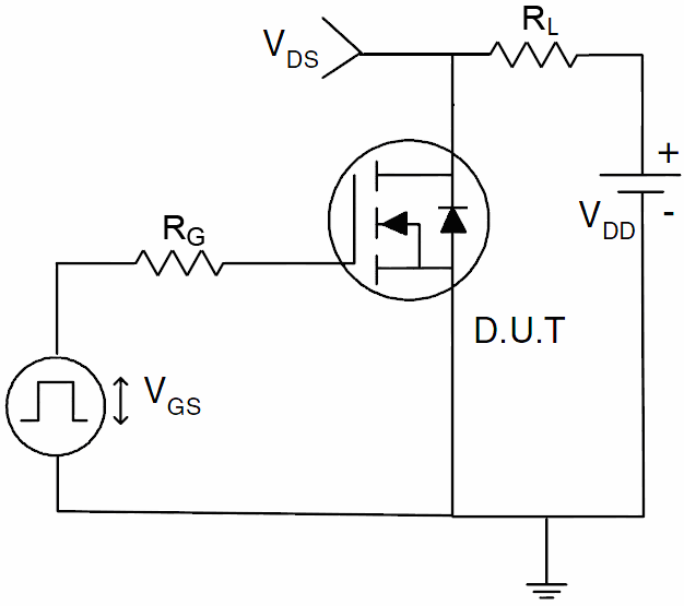
1）E_{AS} test Circuit



2）Gate charge test Circuit



3）Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

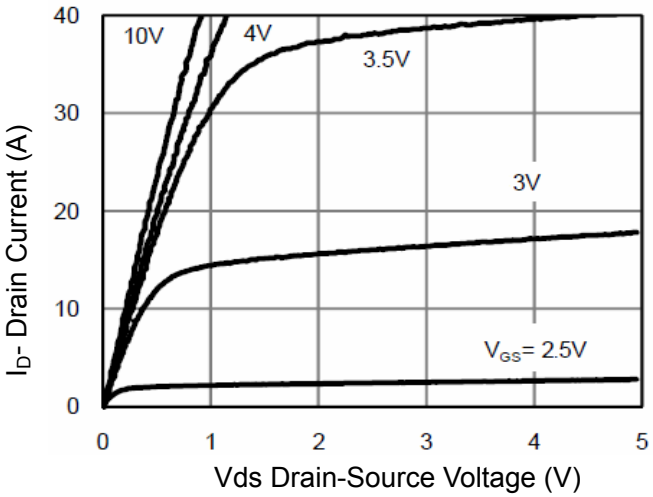


Figure 1 Output Characteristics

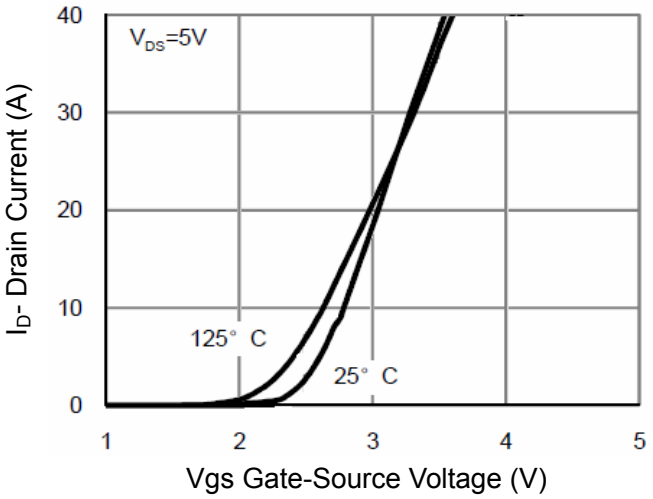


Figure 2 Transfer Characteristics

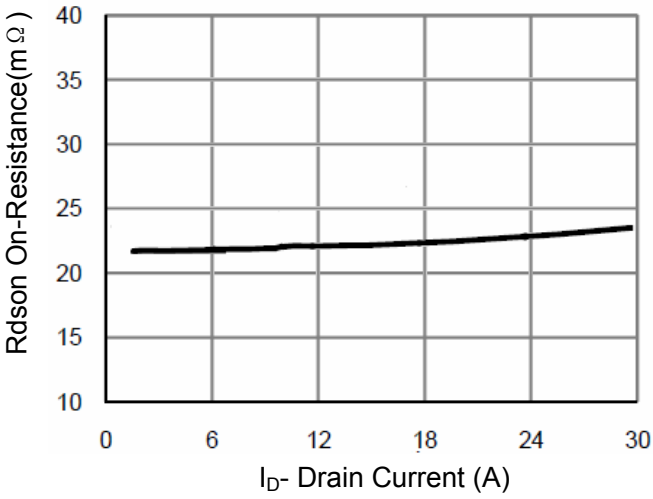


Figure 3 Rdson- Drain Current

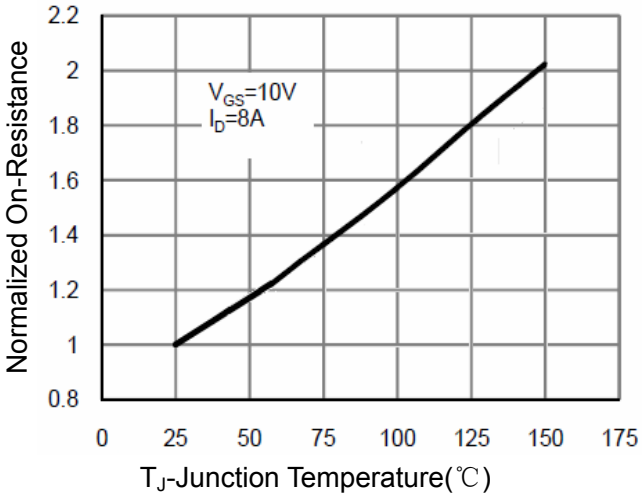


Figure 4 Rdson-JunctionTemperature

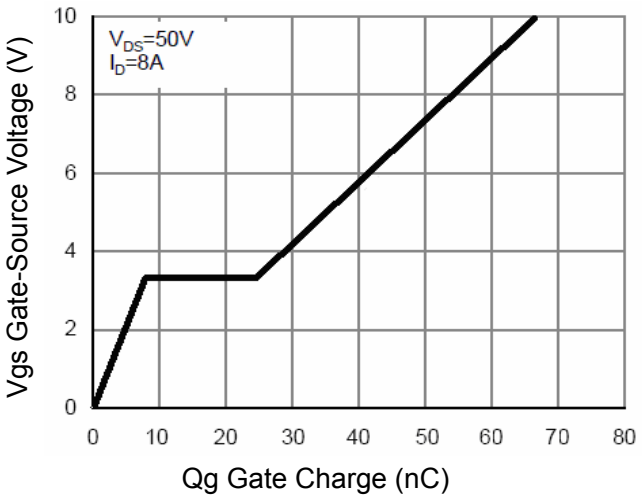


Figure 5 Gate Charge

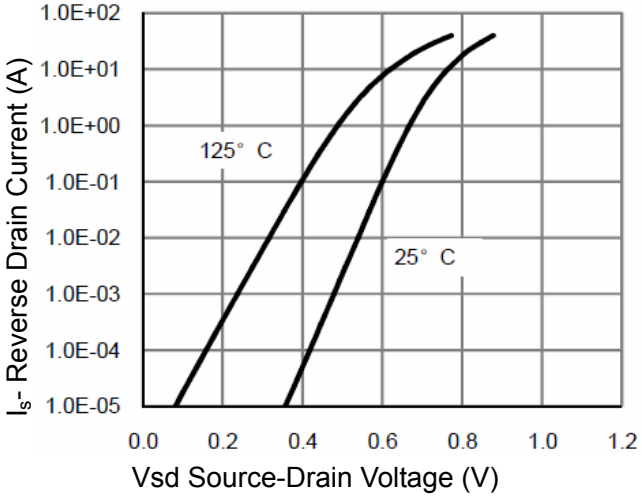


Figure 6 Source- Drain Diode Forward

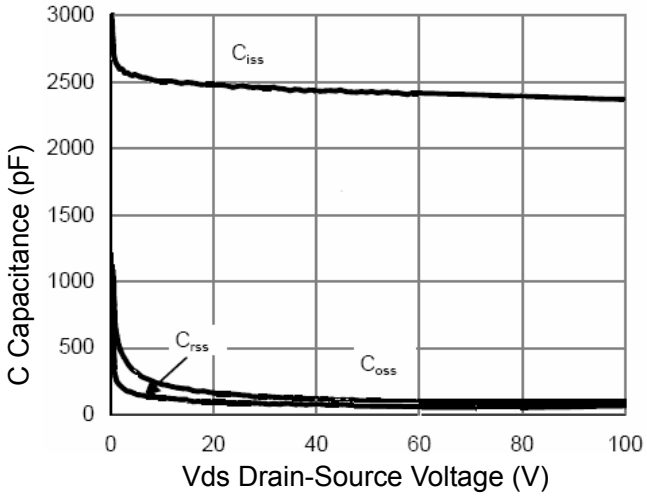


Figure 7 Capacitance vs Vds

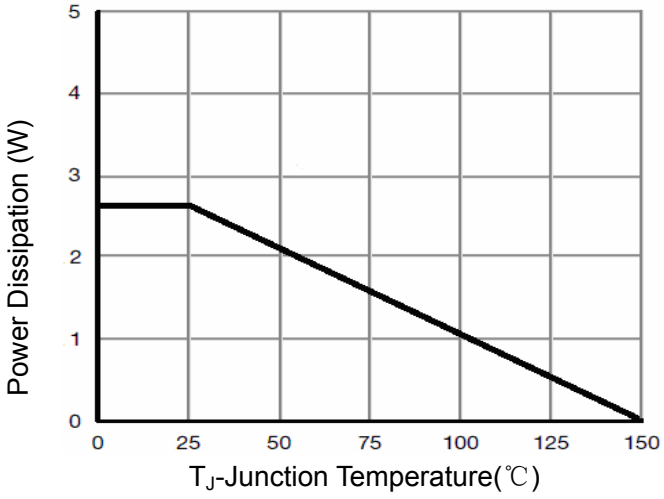


Figure 9 Power De-rating

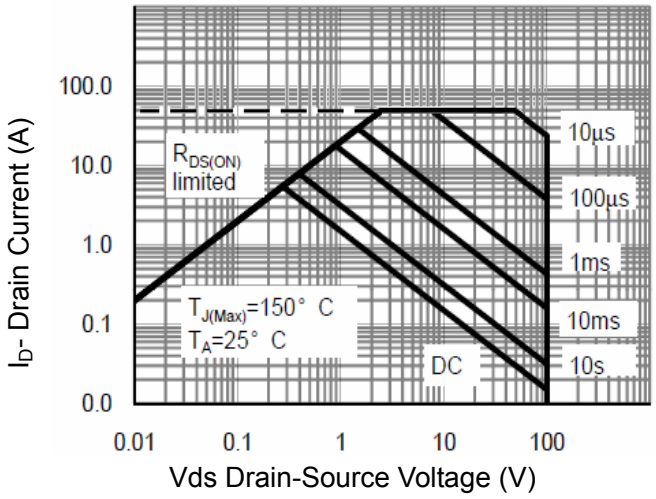


Figure 8 Safe Operation Area

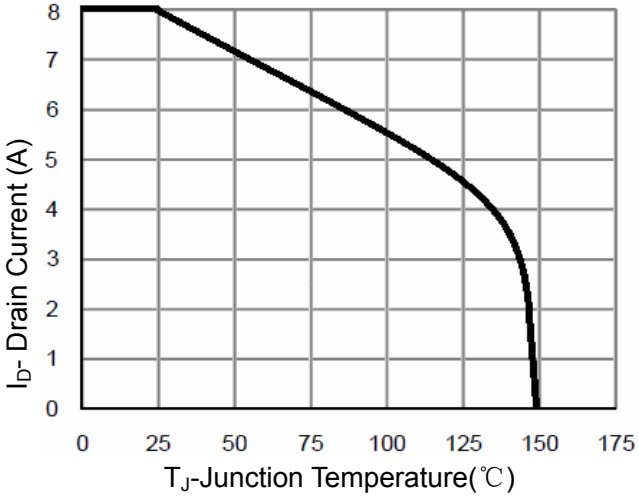


Figure 10 Current De-rating

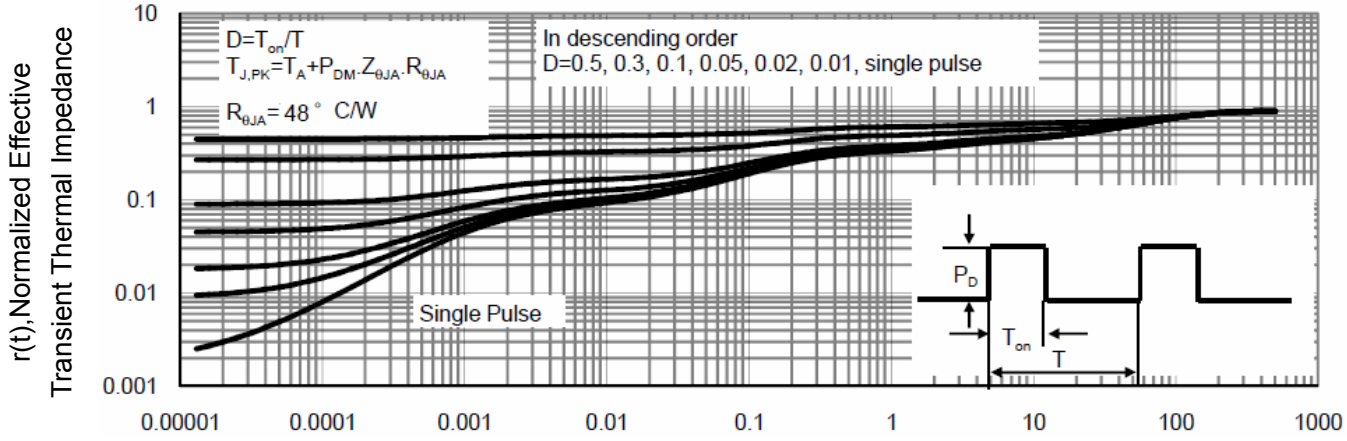


Figure 11 Normalized Maximum Transient Thermal Impedance

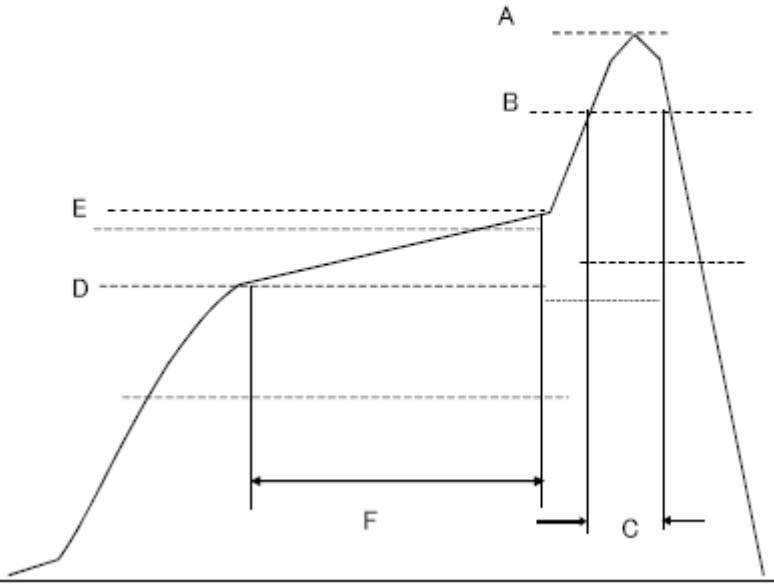
Reflow Curve

The Guarantee Letter of Parts Heat Resistance

新洁能表贴封装产品，有在以下耐热温度条件中保证的可能，建议追记到有关零件承认书的零件耐热保证项目中
(The SMD components of NCE Power have the ability of heat resistance marked below. Please add the information to corresponded items of heat resistance in Supplier Specification Submission.)

〔REFLOW温度PROFILE〕
(REFLOW TEMPERATURE PROFILE)

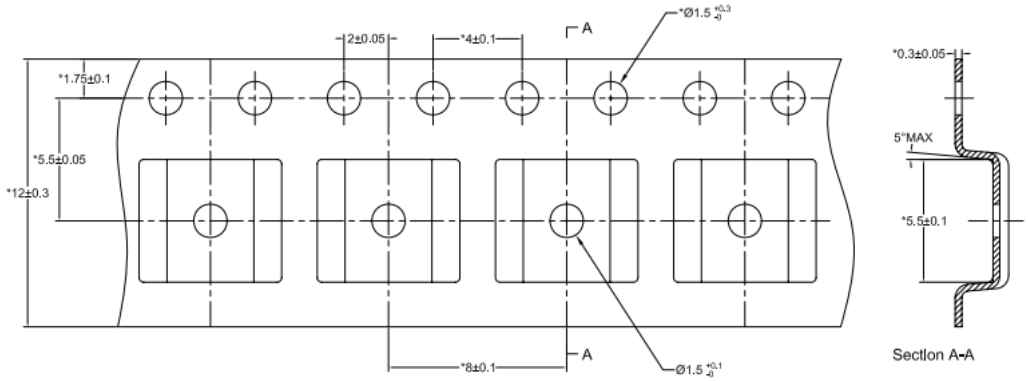
测试POINT：焊接部・part表面
A: 260+5/-0 ℃ B: 217℃ C: 60~150 sec D: 150℃ E: 200℃ F: 90±10 sec

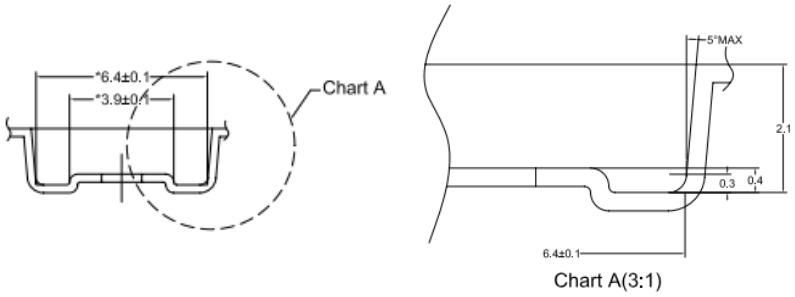


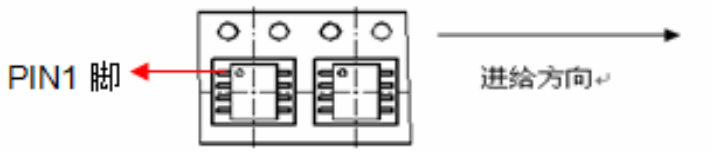
reflow条件(次数等) (Reflow condition (times))	■ 可用以上PROFILE进行3次 (can use the above profile for three times) □ 不可REFLOW (can not Reflow)		
开封后的吸湿保证条件 (Damp resistance after opening)	□无限制 (no limit) (保管条件 (store condition: 30℃ 70%RH以下) 30 ℃ 70%RH below)		
	■开封后 (after opening) 30℃ 60%RH168H→REFLOW		
手焊耐热 (Soldering iron)	350±10℃ 5+1/-0 sec	flow耐热 (flow heat-resistant)	270±3℃ 10+1/-0 sec
Pb含有状况 (Pb content status)	零件外部 (external)	■Pb完全无使用 Pb-free □Pb有使用其位置 (无铅化予定 年 月) Pb used in location (realize Pb-free year month)	
	零件内部 (inside)	□Pb完全无使用 Pb-free ■Pb有使用其位置 (内部电极含有Pb, 无铅化予定 年 月) Pb used in the inside electrodes (realize Pb-free year month)	
	电极镀层的组成 (Composition of lead cladding)	■Sn ，□Sn-Cu ，□Sn-Ag ，□Sn-Bi ，□其他(other)( ) □Sn-Pb (无铅化予定 年 月) (realize Pb-free year month)	
	无铅区分 (Pb-free manage)	□料号变更 (无铅零件料号: ABC12345) P/N changed (Pb-free P/N:) ■料号不变,自然切换 (切换时间点: 年 月 日) P/N not changed,switch naturally (switch time: year month date)	

包装信息

一、载带图纸与产品搭载方向示意图：



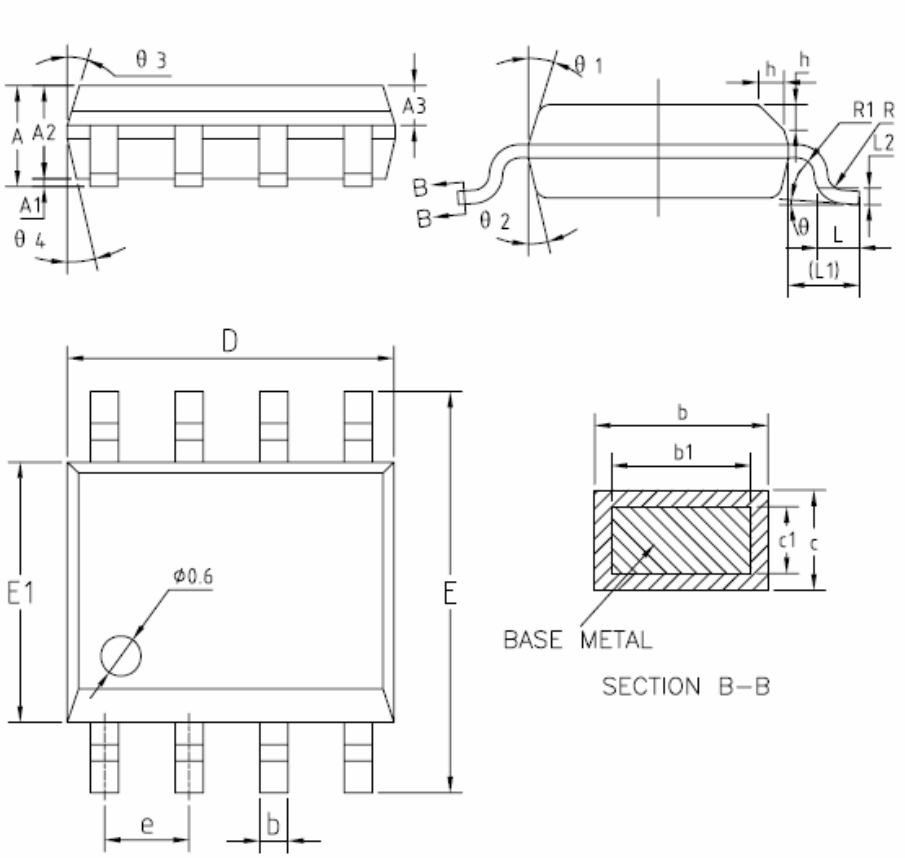




二、包装信息表（满箱信息）

封装形式	包装方式	盘尺寸	只/盘	盘/内盒	只/内盒	内盒/箱	只/箱
SOP8	编带	13 寸	4000	1	4000	5	20000

SOP-8 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	–	0.51
b1	0.37	0.42	0.47
c	0.18	–	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	–	–
R1	0.07	–	–
h	0.30	0.40	0.50
θ	0°	–	8°
θ 1	15°	17°	19°
θ 2	11°	13°	15°
θ 3	15°	17°	19°
θ 4	11°	13°	15°

文件修改履历

修改内容	PCN NO.	修改日期	修改人	版本号
首版	-	2015.04.8	程月东	V1.0
增加包装信息 REFLOW		2021.05.13	程月东	V2.0

Attention:

- Any and all NCE power products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your NCE power representative nearest you before using any NCE power products described or contained herein in such applications.
- NCE power assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all NCE power products described or contained herein.
- Specifications of any and all NCE power products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- NCE power CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all NCE power products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of NCE power CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. NCE power believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the NCE power product that you intend to use.
- This catalog provides information as of Sep.2010. Specifications and information herein are subject to change without notice.