

NCE P-Channel Enhancement Mode Power MOSFET

Description

The NCE30P25Q uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device is suitable for use as a load switch or in PWM applications.

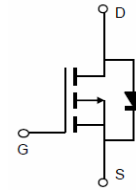
General Features

- $V_{DS} = -30V, I_D = -25A$
 $R_{DS(ON)} < 20m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 11m\Omega @ V_{GS} = -10V$
- High Power and current handing capability
- Lead free product is acquired
- Surface mount package

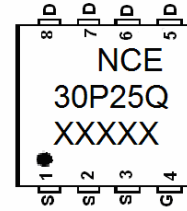
Application

- PWM applications
- Load switch
- Power management

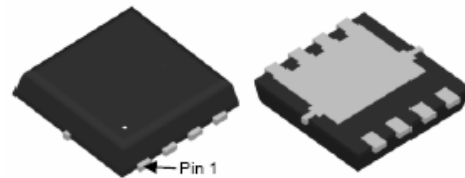
100% ΔV_d s TESTED!



Schematic diagram



pin assignment



Top View

Bottom View

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
NCE30P25Q	NCE30P25Q	DFN3.3X3.3-8L	Ø330mm	12mm	5000 units

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-25	A
Drain Current-Continuous ($T_C = 100^\circ C$)	$I_D(100^\circ C)$	-17.7	A
Drain Current-Pulsed (Note 1)	I_{DM}	-100	A
Maximum Power Dissipation	P_D	40	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case (Note 2)	$R_{\theta JC}$	3.13	$^\circ C/W$
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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.7	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$	-	8.9	11	m Ω
		$V_{GS}=-4.5V, I_D=-15A$	-	15	20	m Ω
Gate resistance	R_G		-	5.2	-	Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-15A$	15	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{ISS}	$V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$	-	1632	-	PF
Output Capacitance	C_{OSS}		-	227	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	178	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-15A,$ $V_{GS}=-10V, R_{GEN}=1\Omega$	-	12	-	nS
Turn-on Rise Time	t_r		-	10	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	nS
Turn-Off Fall Time	t_f		-	13	-	nS
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-20A, V_{GS}=-10V$	-	45.6	-	nC
Gate-Source Charge	Q_{gs}		-	4.6	-	nC
Gate-Drain Charge	Q_{gd}		-	11.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-15A$	-	-	-1.2	V

Notes:

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

Typical Electrical and Thermal Characteristics



Figure 1: Switching Test Circuit

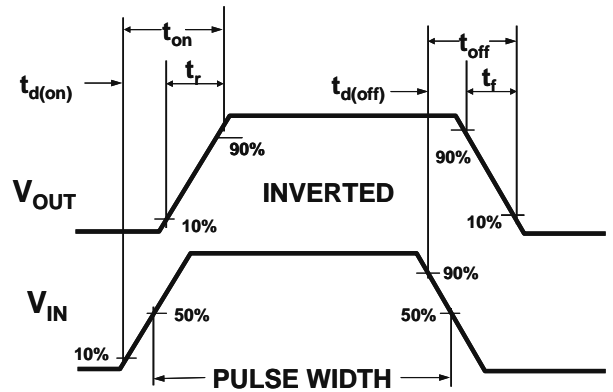


Figure 2: Switching Waveforms

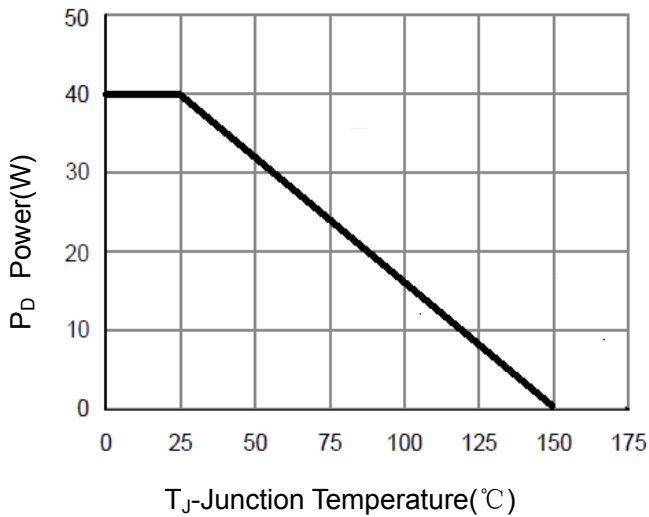


Figure 3 Power Dissipation

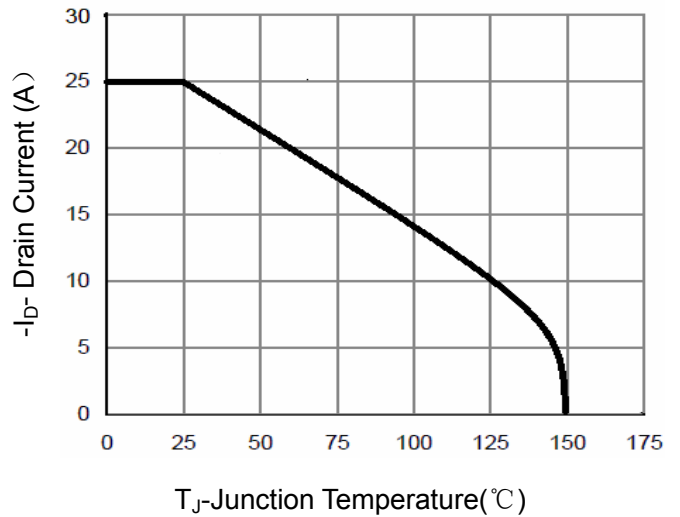


Figure 4 Drain Current

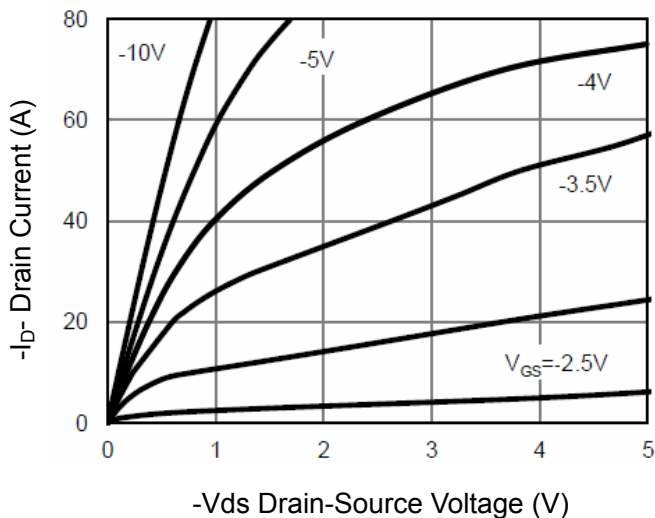


Figure 5 Output Characteristics

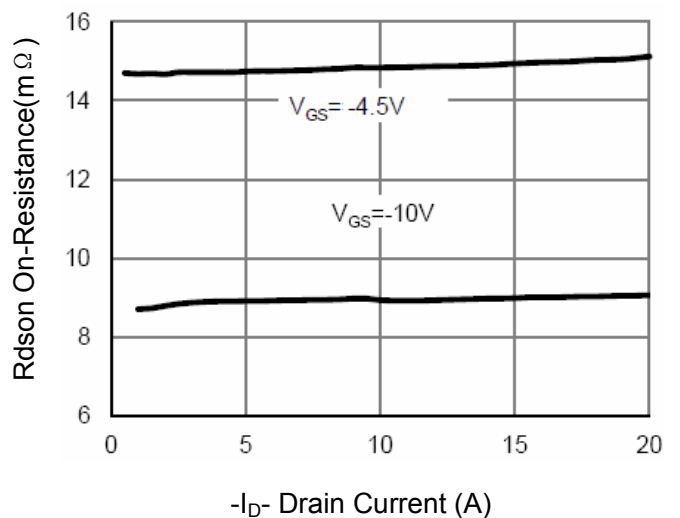


Figure 6 Drain-Source On-Resistance

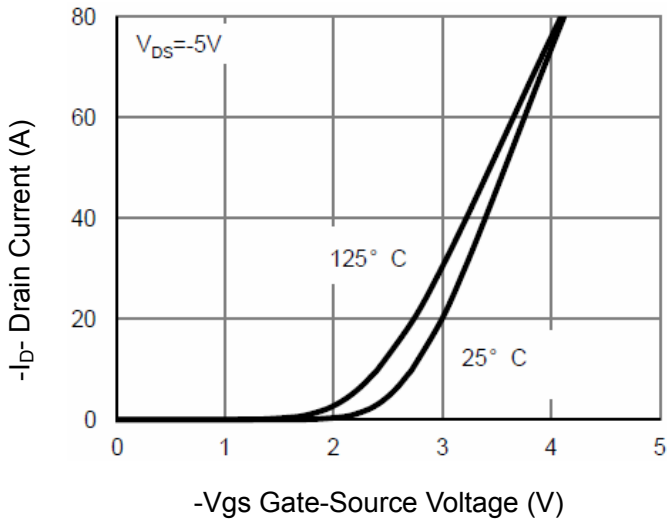


Figure 7 Transfer Characteristics

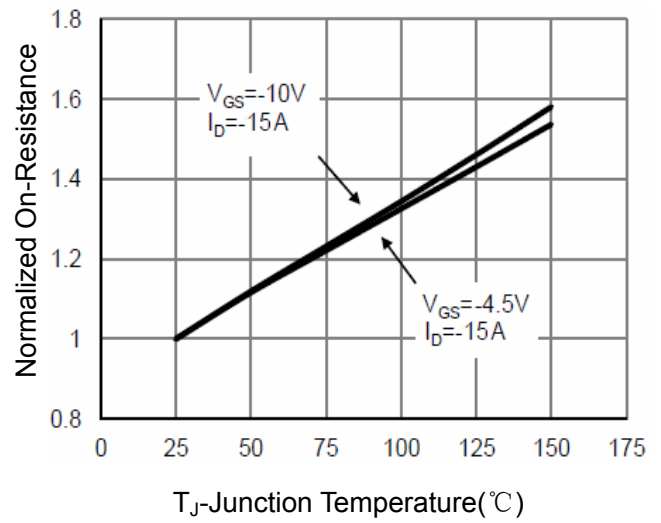


Figure 8 Drain-Source On-Resistance

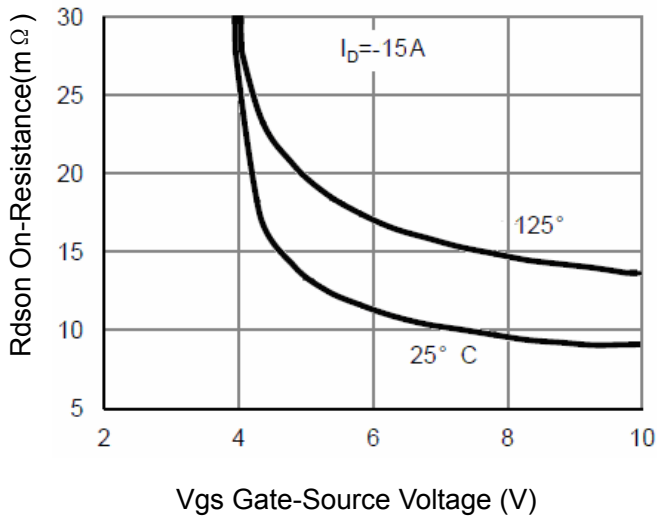


Figure 9 Rdson vs Vgs

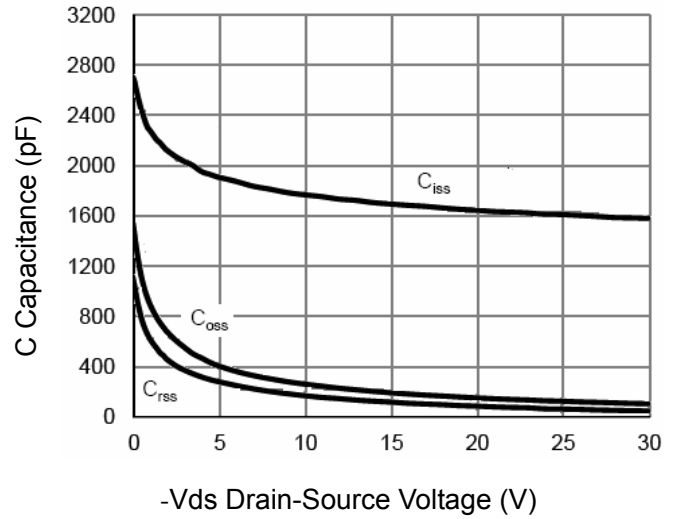


Figure 10 Capacitance vs Vds

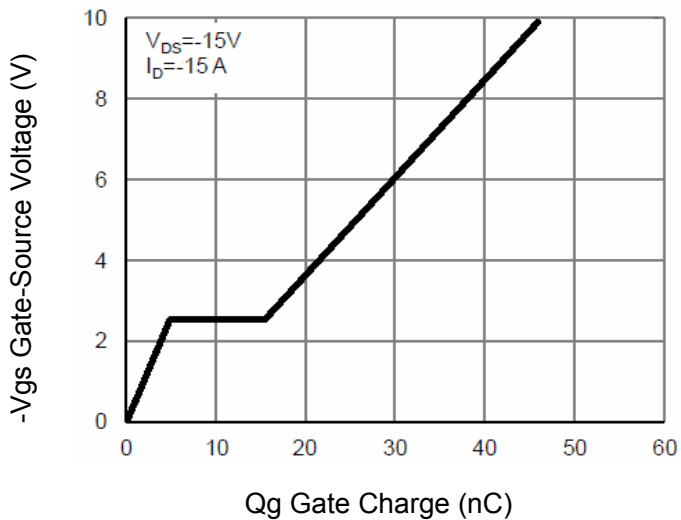


Figure 11 Gate Charge

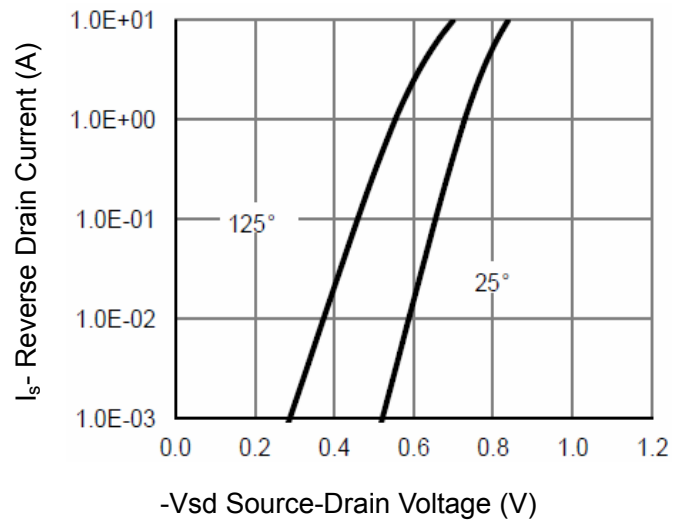
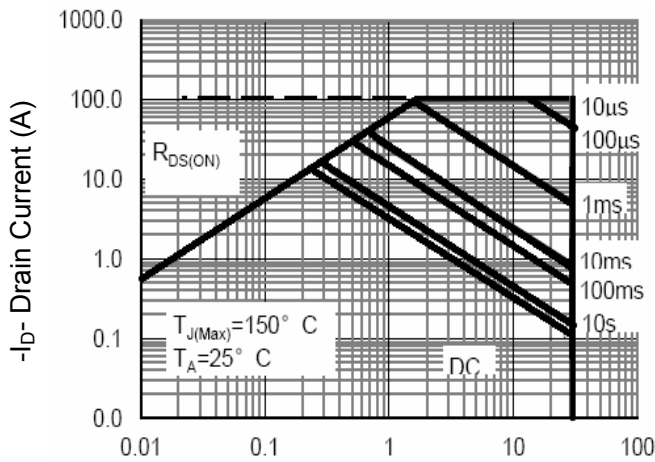
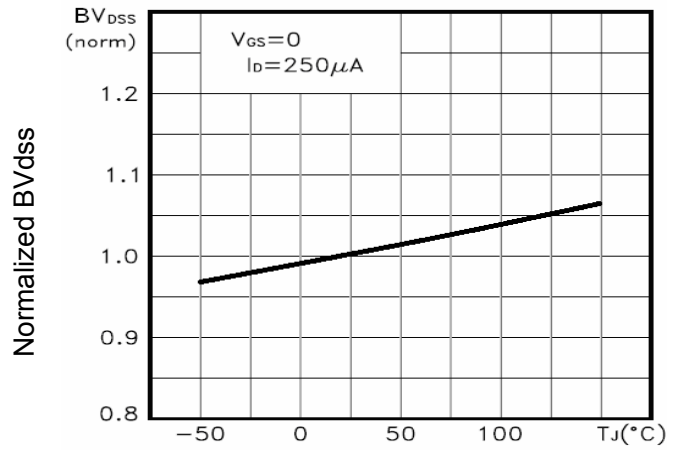


Figure 12 Source- Drain Diode Forward



-Vds Drain-Source Voltage (V)
Figure 13 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 14 BV_{DSS} vs Junction Temperature

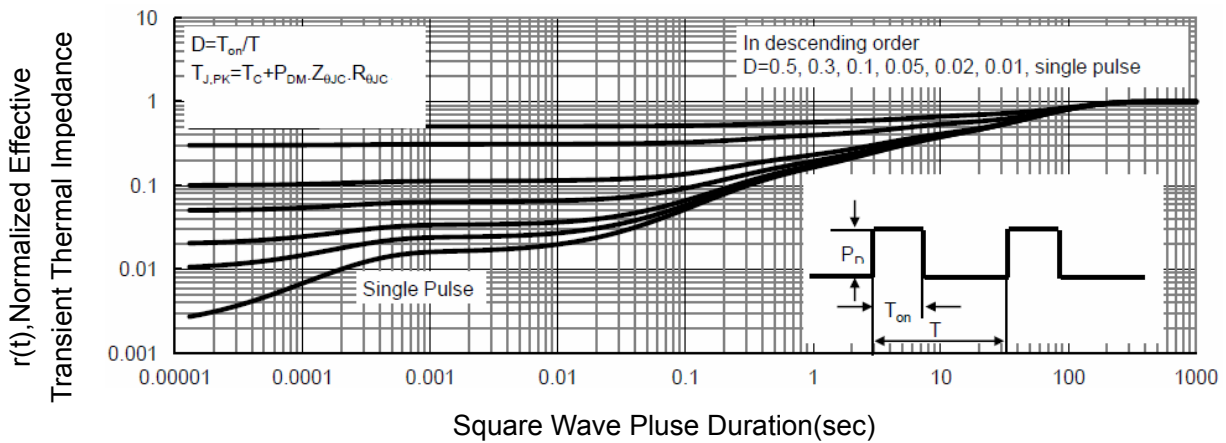
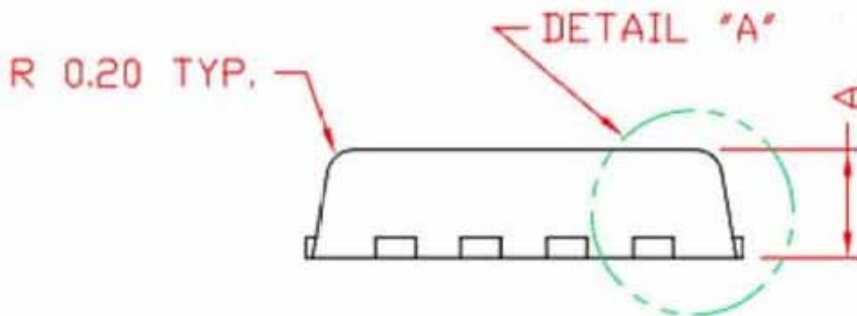
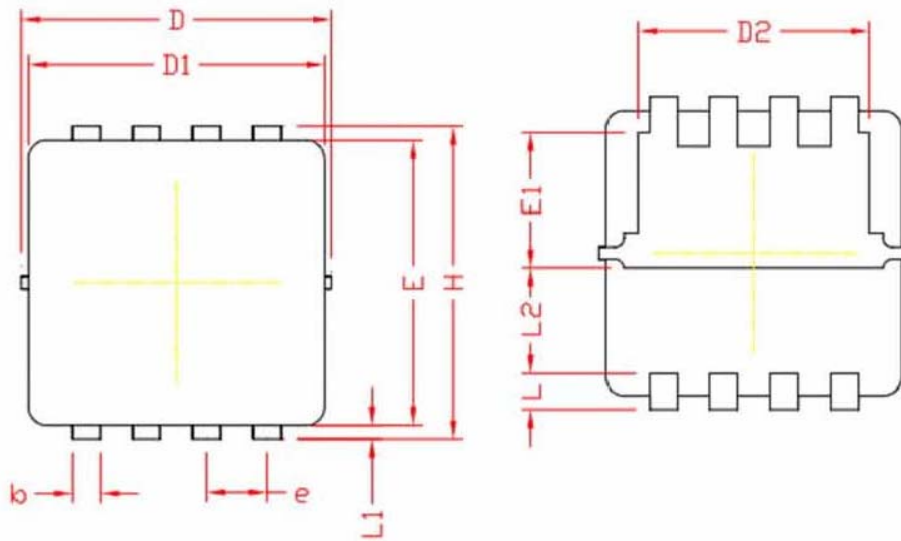


Figure 15 Normalized Maximum Transient Thermal Impedance

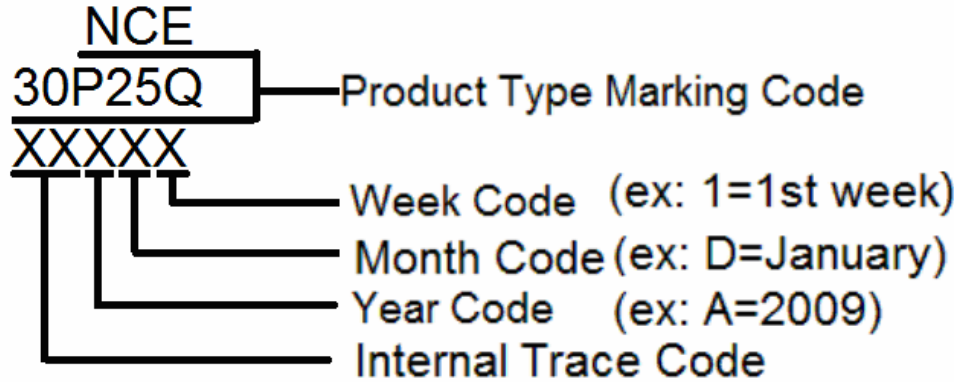
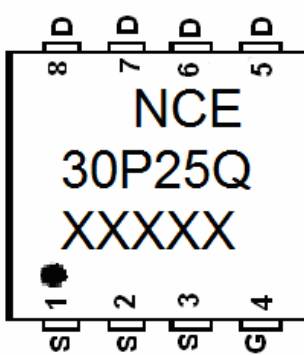
DFN3.3X3.3-8L Package Information



(UNITS OF MEASURE=MILLIMETER)

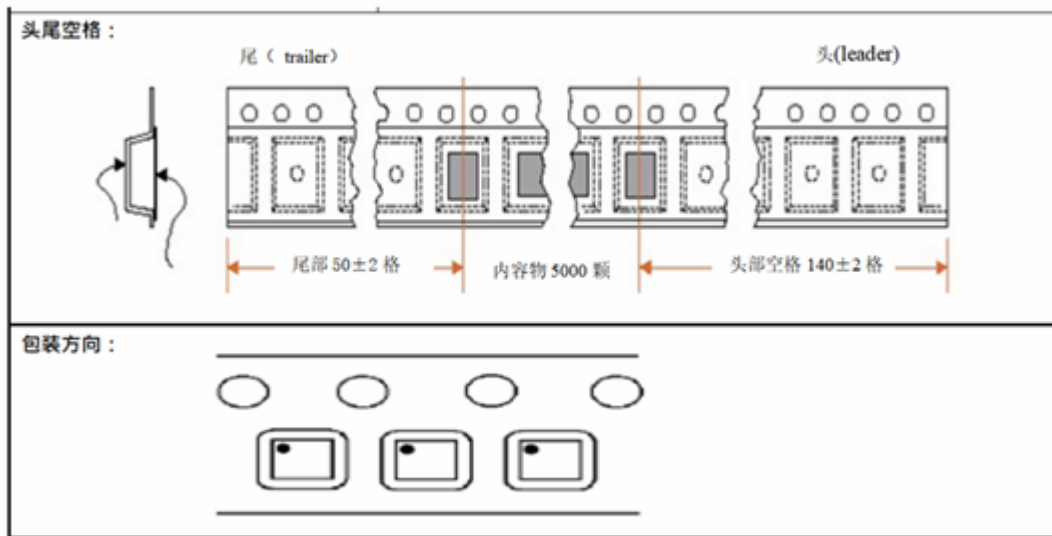
SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		

DFN3.3X3.3-8L Part Marking



包装信息

一、载带图纸与产品搭载方向示意图：



二、标签（标签尺寸：100*60mm或100*50mm）示意图：



说明：以上标签内容仅作参考，品种会根据实际印章品名打印。

三、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
PDFN3.3*3.3-8L	编带	13寸	5000	1	5000	5	25000

四、包装流程图



图 1: 采用白色 13" Reel. 产品标签贴在载带步进孔的后面。

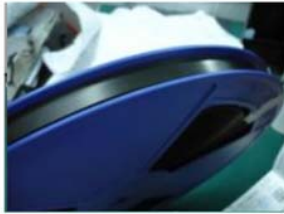
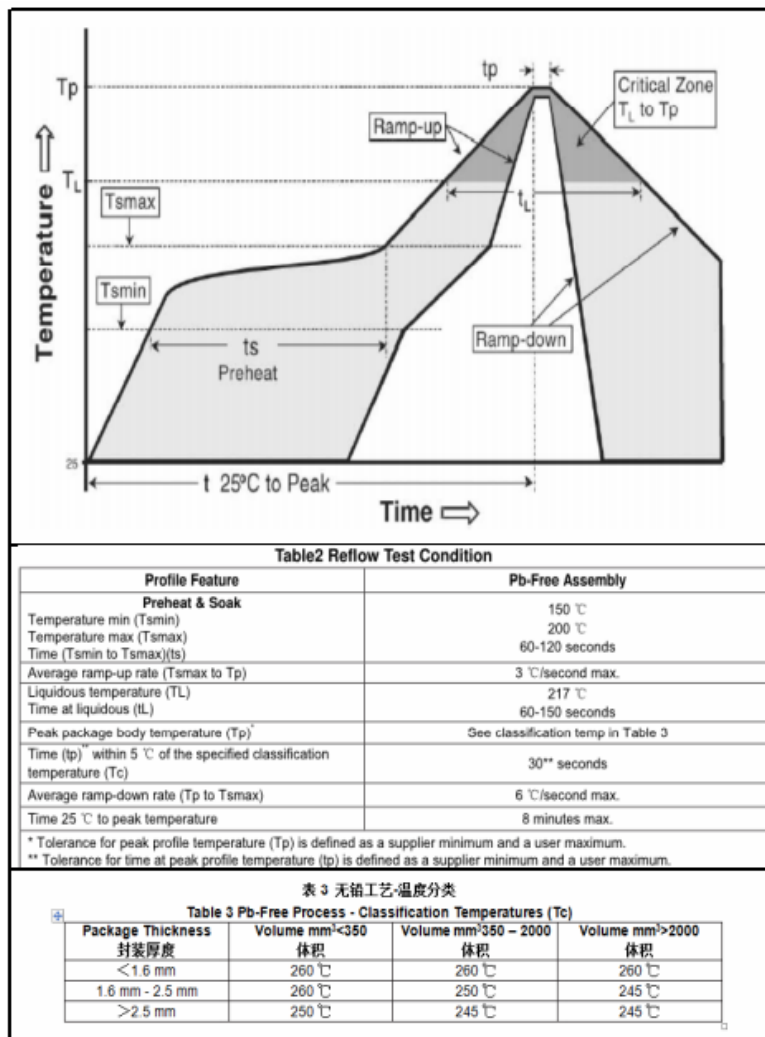


图 2: 为了防止抽真空后卷盘变形, 载带外圈需使用黑色保护带包围, 并用黑色防静电胶带固定。如果未满卷, 保护带内需使用泡棉条填充。



图 3: 将 1 个卷盘放入防潮袋中, 并放入一包干燥剂 (1 unit/包), 不需要湿度显示卡。

回流焊曲线



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