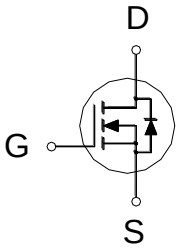
NIKO-SEM

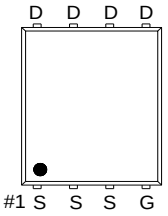
N-Channel Enhancement Mode Field Effect Transistor

P3710BK
PDFN 5x6P
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	37mΩ	24A





G. GATE
D. DRAIN
S. SOURCE

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	24	A
	T_C = 100 °C		15	
Pulsed Drain Current[1]		I_{DM}	50	
Continuous Drain Current	T_A = 25 °C	I_D	6	
	T_A = 70 °C		5	
Avalanche Current		I_{AS}	16	
Avalanche Energy	L = 1mH	E_{AS}	128	mJ
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		20	
Power Dissipation	T_A = 25 °C	P_D	2.7	W
	T_A = 70 °C		1.7	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	$R_{\theta JA}$		46	°C / W
Junction-to-Case	$R_{\theta JC}$		2.5	

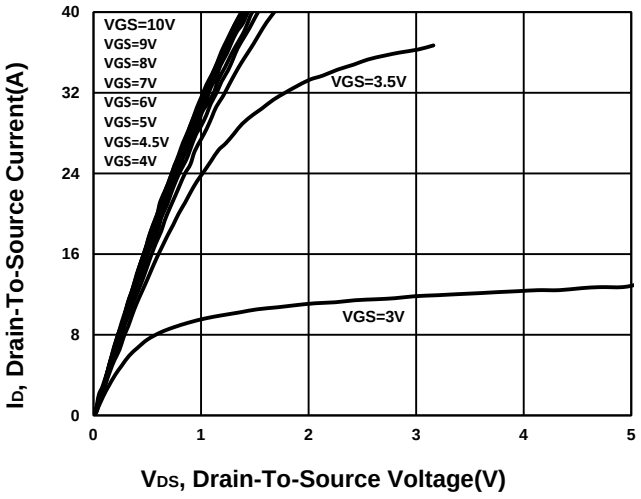
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

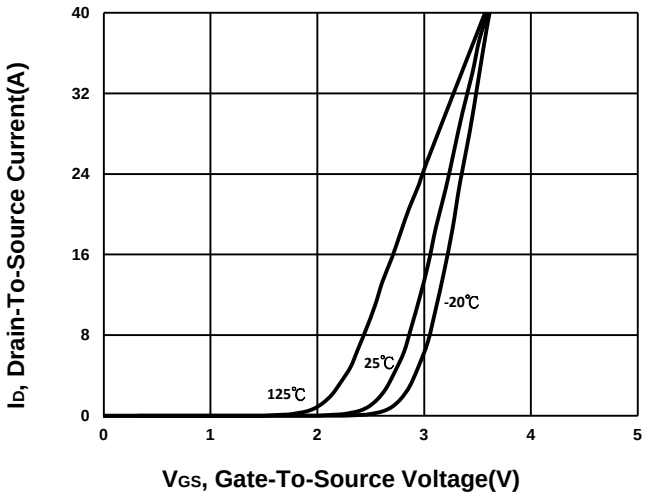
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.8	2.3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D =6A		30	48	mΩ
		V_{GS} = 10V, I_D = 6A		27	37	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 6A		30		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1049		pF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			56		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.3		Ω
Total Gate Charge[2]	Q_g (V_{GS} = 10V)	V_{DS} = 50V , V_{GS} = 10V, I_D = 6A		23		nC
	Q_g (V_{GS} = 4.5V)			12.8		
Gate-Source Charge[2]	Q_{gs}			3.5		
Gate-Drain Charge[2]	Q_{gd}			7.8		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 50V , I_D ≅ 6A, V_{GS} = 10V, R_{GEN} =6Ω		32		nS
Rise Time[2]	t_r			22		
Turn-Off Delay Time[2]	$t_{d(off)}$			46		
Fall Time[2]	t_f			22		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				24	A
Forward Voltage[1]	V_{SD}	I_F = 6A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 6A, dI_F/dt = 100A / μS		31		nS
Reverse Recovery Charge	Q_{rr}			35		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

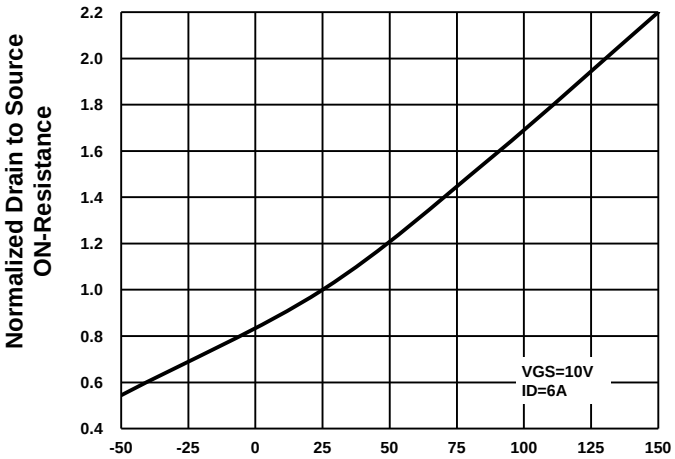
Output Characteristics



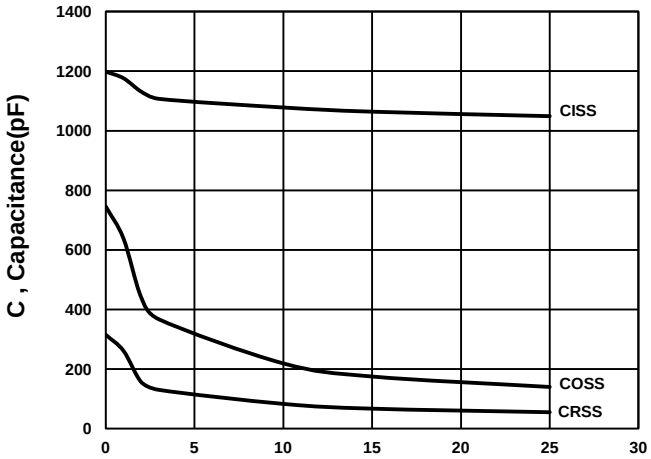
Transfer Characteristics



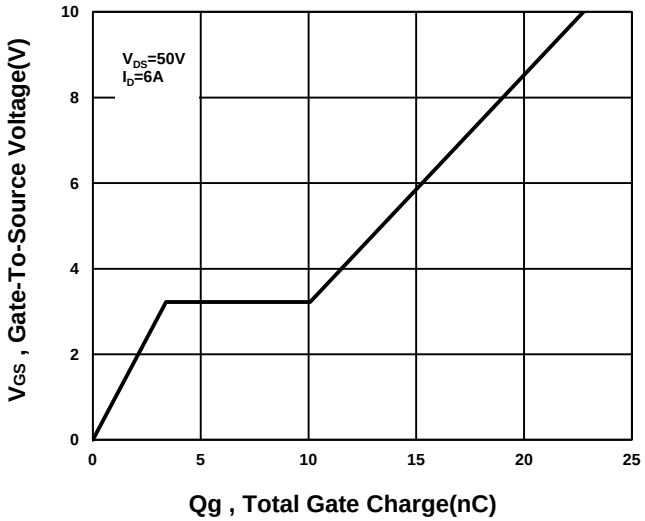
On-Resistance VS Temperature



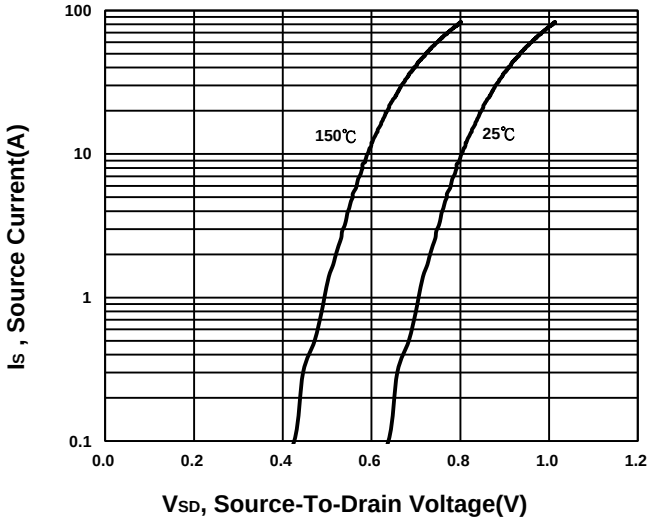
Capacitance Characteristic



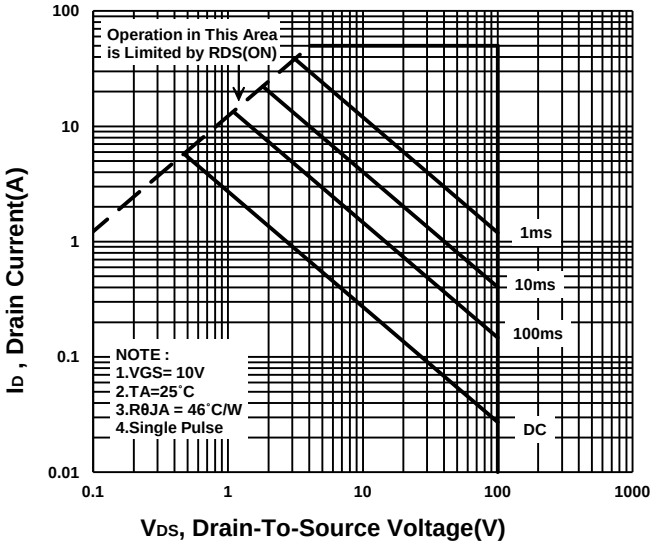
Gate charge Characteristics



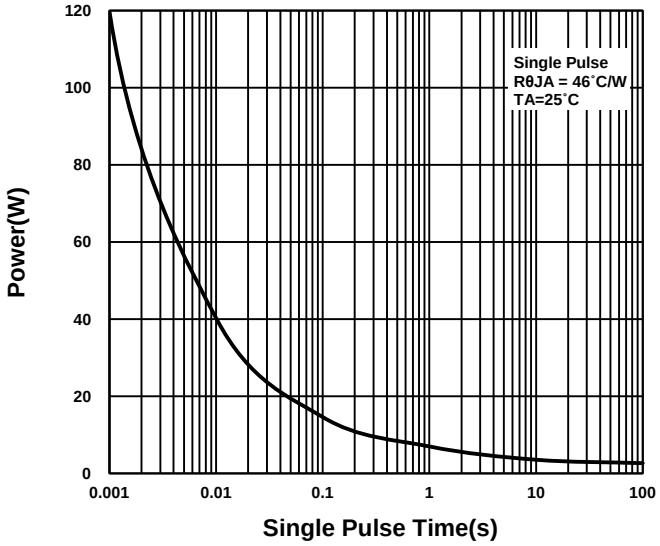
Source-Drain Diode Forward Voltage



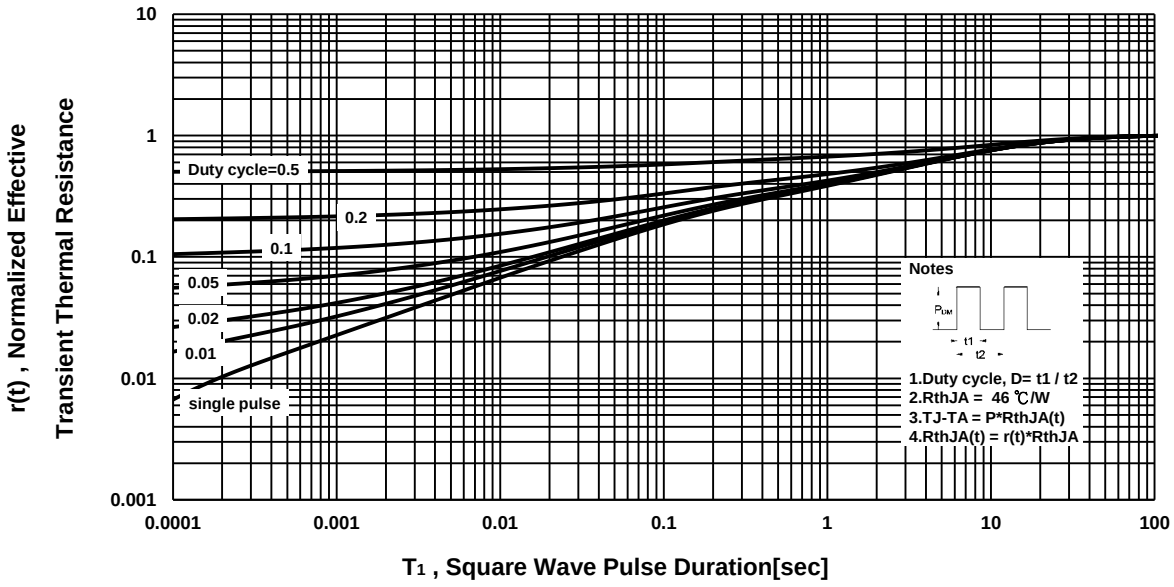
Safe Operating Area



Single Pulse Maximum Power Dissipation



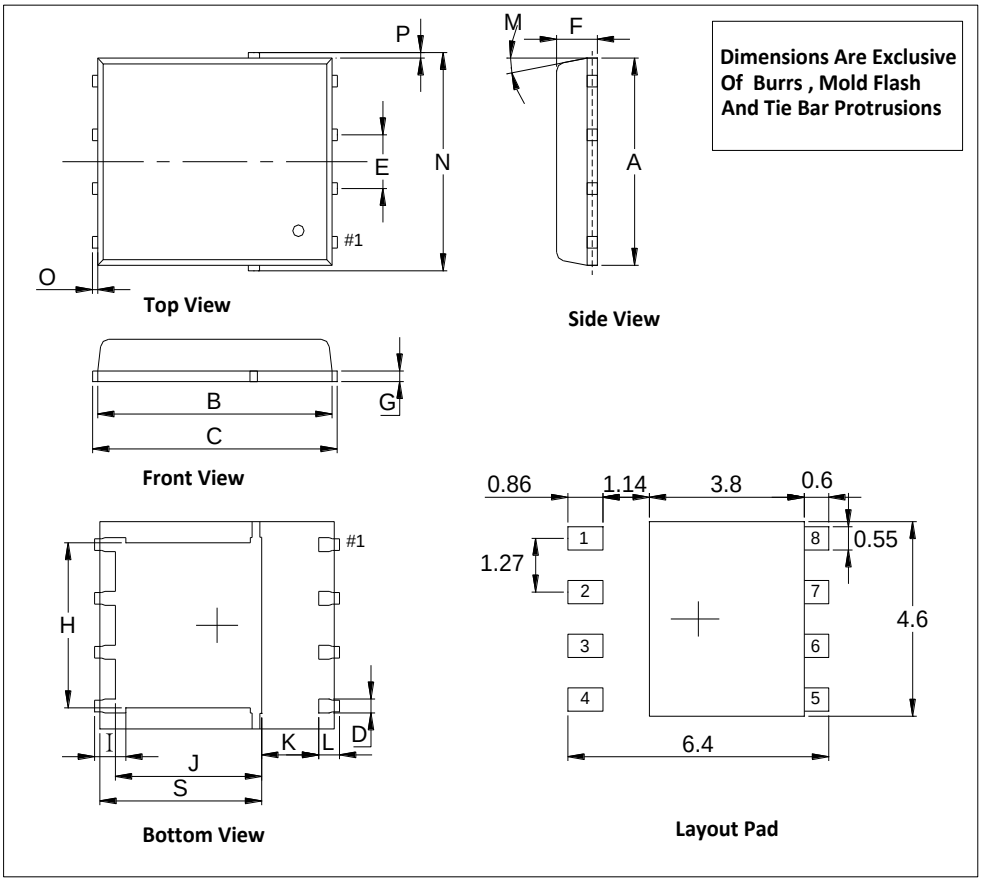
Transient Thermal Response Curve



Package Dimension

PDFN 5x6P MECHANICAL DATA

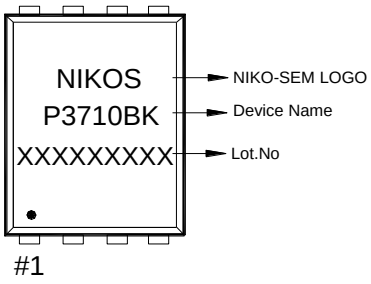
Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8		5.15	J	3.34		3.9
B	5.42		5.9	K	0.9		
C	5.9		6.35	L	0.38		0.711
D	0.3		0.51	M	0°		12°
E	1.17	1.27	1.37	N	4.8		5.4
F	0.8	1	1.2	O	0.05		0.36
G	0.15		0.35	P	0.05		0.25
H	3.67		4.31	S	3.73		4.19
I	0.38		0.71				



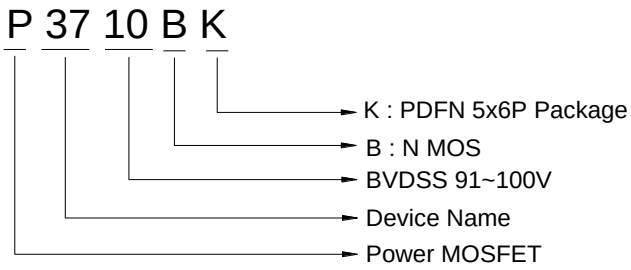
＊因應各家封裝模具不同而外觀略有所差異，不影響電性及 Layout。

Marking Information:(Please see the corresponding data sheet)

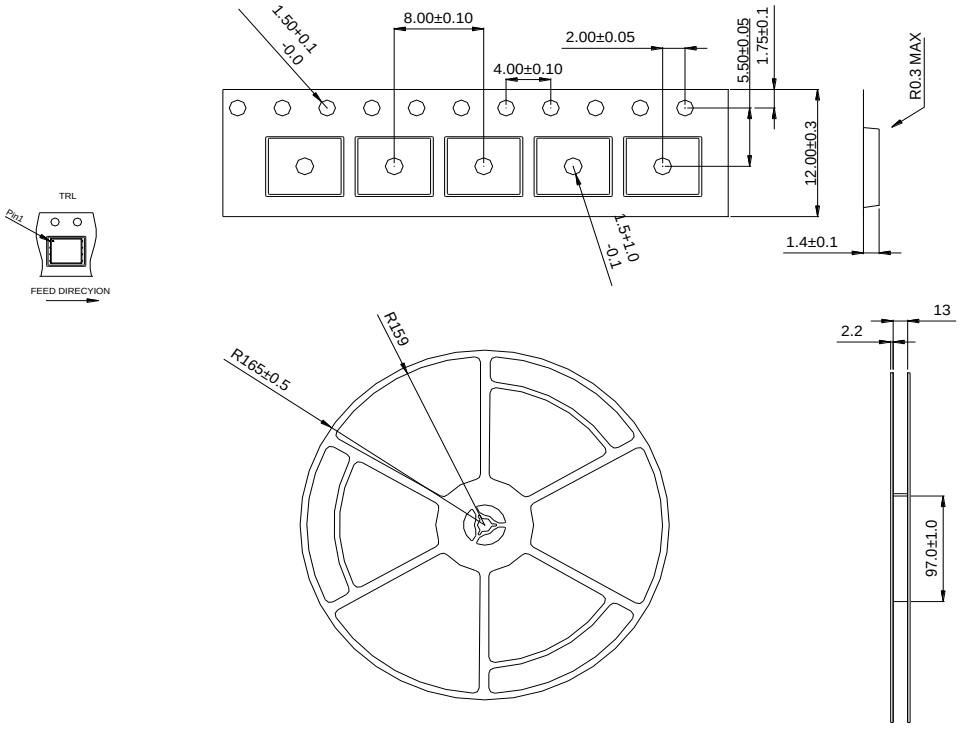
1.零件 Marking 文字面說明(Laser Marking)



2.零件 Part number 說明



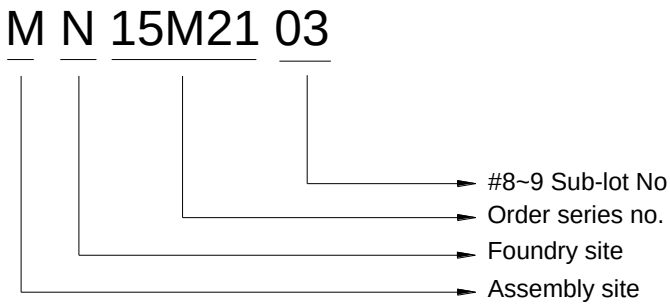
Tape&Reel Information:3000pcs/Reel



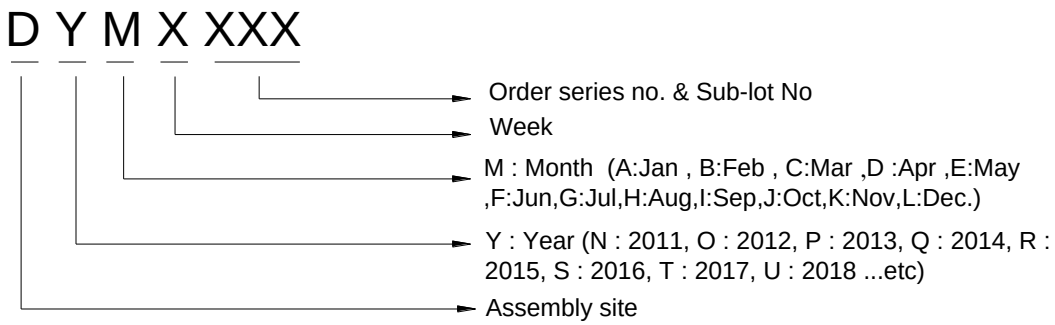
附註:All Dimension in millimeter

Lot.No. & Date Code rule

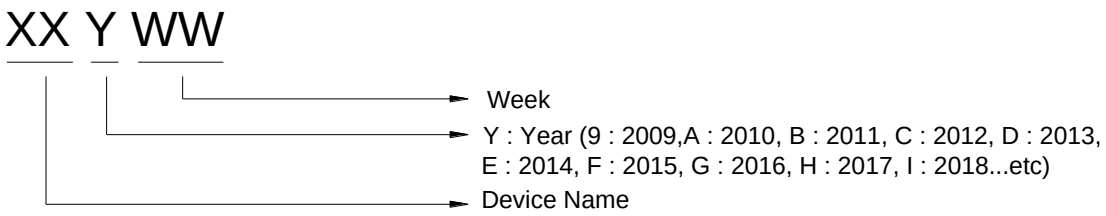
1.LOT.NO.



2.Date Code

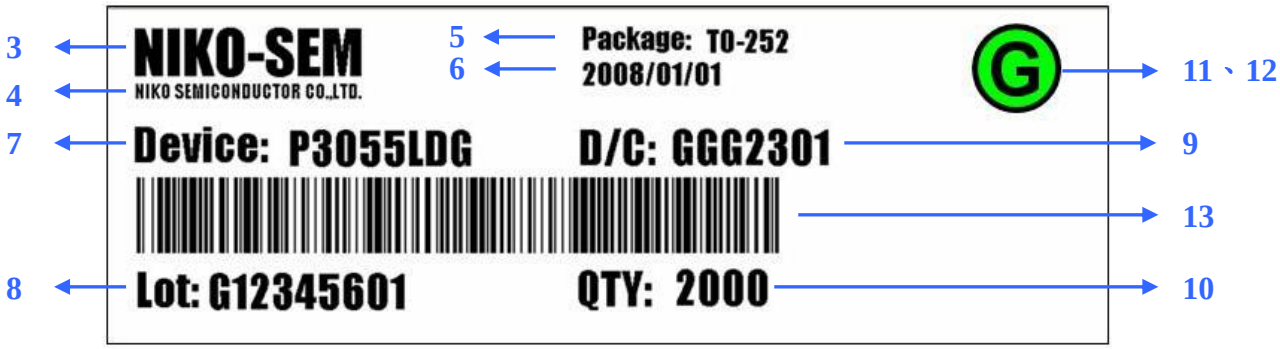


3.Date Code (for Small package)



Label rule

標籤內容 (Label content)



1	Label Size	30 * 90 mm
2	Font style	Times New Roman or Arial (或可區分英文"O"和數字"0"，"G 和"Q"的字型即可) (Or any font capable of being distinguished for Letter O and digital 0, and for G and Q))
3	NIKO-SEM	Height: 4 mm
4	NIKO SEMICONDUCTOR CO., LTD.	Height: 1 mm
5	Package	Height: 2 mm
6	Date	Height: 2 mm Shipping date: YYYY/MM/DD, ex. 2008/09/12
7	Device	Height: 3 mm (Max: 16 Digit) Device Name not including Rev.
8	Lot	Height: 3 mm (Max: 9 Digit) Sub lot
9	D/C	Height: 3 mm (Max: 7 Digit)
10	QTY	Height: 3 mm (Max: 6 Digit) Thousand mark is no needed
11	Pb Free label	Diameter: 1 cm bottom color: Green Font color: Black Font style: Arial
12	Halogen Free label	Diameter: 1 cm bottom color: Green Font color: Black Font style: Arial
13	Scan info	Device / Lot / D/C / QTY , Insert " / " between every parts. for example: P3055LDG/G12345601/GGG2301/2000 DPI (Dots per inch): Over 300 dpi Code : Code 128 Height: 6 mm at least

TPV TECHNOLOGY LIMITED

Product Information

Product Name : P3710BK

Start Date of Production : 2013-11-26

Process : ____ μm, ___Poly ___Metal layer *1

Wafer Diameter : 8 inch *1

Die Size : 2728um*1786um

Chip(Die) Coating : ☒No , ☐Yes *1

Testing Fault Coverage : _____ %

MTTF(Mean Time To Failure):_____FIT

DPM(Defect Per Million): 200 PPM *5

Circuit Design Center : _____

Design Center Location : _____

Test Ambient Temp. at :___℃, 25 ℃, 80 ℃, *1

Burn-In Test : ☒No, ☐Yes, ___℃,___hrs

Moisture Sensitive Level : 1 *1

Packing Specifications: ☐Tray ☒Reel ☐Tube *3

Packing with MBB *2 : ☒Yes , ☐No *1

Lead Coplanarity spec. : < 4 mil

Lead Plating thickness spec. : 200~850 μ inch

net weight: 89.307 mg

☐ **Fab Site – 1** *1		☐ **Fab Site -2** *1	
Fab. Company	Fab. Location	Fab. Company	Fab. Location
UMC	Taiwan	Vanguard	Taiwan
Trace Code for Fab site :		Trace Code for Fab site :	

☐ **Fab Site – 3** *1		**Fab Site – 4** *1	
Fab. Company	Fab. Location	Fab. Company	Fab. Location
ADVANCED	Taiwan		

☐ **Assembly Site – 1** *1	
Assembly House Company	GEM
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	G: GEM

☐ **Assembly Site – 2** *1	
Assembly House Company	ASE
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	S: ASE

Supplier Name: _____

Supplier Signatory: _____

Date: _____

Product Information

☐ Assembly Site – 3 *1	
Assembly House Company	TFME
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	V: TFME

☐ Assembly Site – 4 *1	
Assembly House Company	GTBF
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	U: GTBF

☐ Assembly Site – 5 *1	
Assembly House Company	Fenghua
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	6: Fenghua

☐ Assembly Site – 6 *1	
Assembly House Company	JCET
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	K: JCET

☐ Assembly Site – 7 *1	
Assembly House Company	AIC
Assembly House Location	China
Molding Compound	Silica
Solder	Soft Solder
Bonding Wire Diameter	Bonding Wire
Bonding Wire Material	Metal
Lead Frame Material	Copper Alloy
Ink for Top Surface	Laser Mark
Plating or Solder Ball Composition and thickness	Pure Tin
Trace Code for Assy house	A: AIC

☐ Final Test Site – 1 *1	
Final Test Company	GEM
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	G: GEM

☐ Final Test Site – 2 *1	
Final Test Company	ASE
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	S: ASE

☐ Final Test Site – 3 *1	
Final Test Company	TFME
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	V: TFME

☐ Final Test Site – 4 *1	
Final Test Company	GTBF
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	U: GTBF

☐ Final Test Site – 5 *1	
Final Test Company	Fenghua
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	6: Fenghua

☐ Final Test Site – 6 *1	
Final Test Company	JCET
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	K: JCET

☐ Final Test Site – 7 *1	
Final Test Company	AIC
Final Test Location	China
100% Lead Scan before Shipping	Yes
Trace Code for F/T	A: AIC

*1 : Any change of IC Circuit Design, Wafer Mask, , Manufacturer Location, Material, Diameter, Electric Testing parameter, Product Data Sheet, Marking on top side surface, Supplier must issue PCN(Product Process Change) to TPV and get TPV approval to TPV and get TPV RD-CE approval

*2 : MBB : Moisture Barrier Bag (J-STD-033)

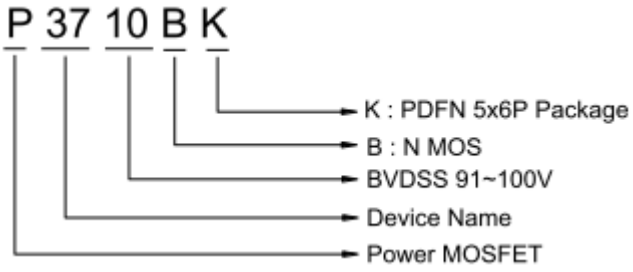
*3 : Any Information change of Label Marking, Supplier must issue PCN(Product Process Change) to TPV.

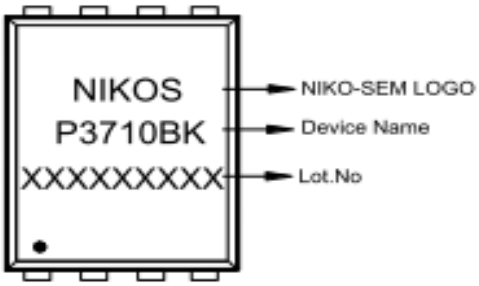
*4 Product version recognition must be shown on the Shipping Label of outer and Inner box, Product version recognition must be shown marking of the top side surface of product.

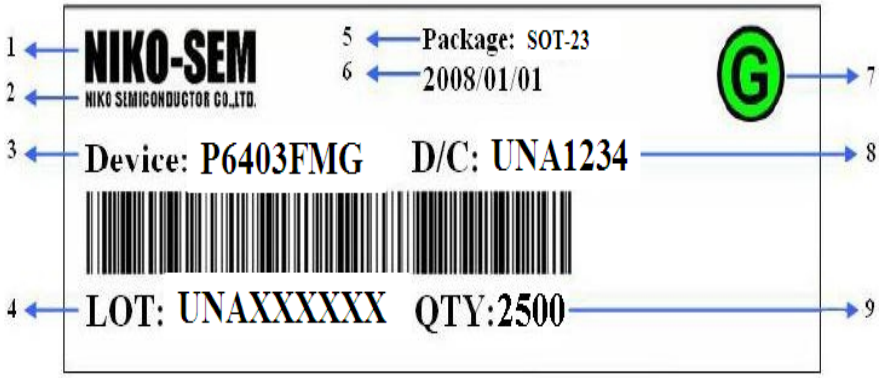
*5: DPM: Means Defect per million for customer.

Other : Product which shipped to TPV, Product date code must be within one year.

Product Information

Product Naming Rule	
Naming	Explanation (Supplier must indicate how to recognize the Product version)
P3710BK	

Marking Rule of Product Top Side Surface *1		
Marking Information	Column	Explanation (Supplier must indicate how to recognize the Product version)
	Column 1	公司名稱縮寫
	Column 2	產品名稱
	Column 3	批號
	Column 4	
	Column 5	
	Column 6	

Marking Rule of Outer Box Label *3		
Marking Information	Column	Explanation (Supplier must indicate how to recognize the Product version)
 示意圖	Column 1	公司商標
	Column 2	公司全名
	Column 3	產品名稱
	Column 4	批號
	Column 5	機種
	Column 6	日期
	Column 7	無鉛/無鹵標籤
	Column 8	生產日期代碼
	Column 9	數量

TEST SEQUENCE FOR ELECTRICAL COMPONENTS

TPV D/N : TP-C-F-CE-007
TPV P/N : 357G763N100096
SUPPLIER NAME: NIKO SEMICONDUCTOR CO., LTD.
SUPPLIER P/N : P3710BK
DATE : 2018/11/29 REV.A

NO.	VERIFICATION ITEM	TEST CONDITION	JUDGEMENT	SAMPLES (Min-Qty)	TEST DATA MAX	TEST DATA MIN	TEST DATA AVERAGE	TEST DATA CP/CPK	JUDGE OK/NG	PAGE	RD 零件承认评估项目	SQA 日常管控项目
1.	ELECTRICAL MEASUREMENTS											
1-1.	INITIAL PARAMETER TESTS											
	Rds(on)	Follow spec ,	Based on Approved Spec , CPK >1.33	30pcs	27.6	23.7	26.0425	5.69091251				
	Vgs(th)	Follow spec ,	Based on Approved Spec , CPK >1.33		1.782	1.782	1.9692925	1.44428031				
	Idss	Follow spec ,	Based on Approved Spec.		0.011	0.007	0.00866667					
	Igss	Follow spec ,	Based on Approved Spec .		5.69	3.3	4.56633333					
	Gfs	Follow spec ,	Based on Approved Spec ,		32.11	29.58	30.821					
	Qg	Follow spec ,	Based on Approved Spec ,		24.77	24.13	24.35					
	VISO for TO-220F	Follow spec ,	Based on Approved Spec ,									
1-2.	DYNAMIC TESTS											
	BVdss	Follow spec ,	Based on Approved Spec ,	30pcs	113.25	103.87	108.589					
	Ciss	Follow spec ,	Based on Approved Spec ,	5pcs	1136.8	1121.01	1128.40167					
	Coss	Follow spec ,	Based on Approved Spec ,	5pcs	146.506	143.133	145.326867					
	Crss	Follow spec ,	Based on Approved Spec ,	5pcs	63.7833	60.4375	62.54386					
	ESD Human Body Model	MIL std 883C R=1.5k ohm,C=100pf	>2000v on all pins	5pcs								
2	LIFE STRESS TEST											
	Operation Life	JEDEC or MIL-STD-750D METHOD 1027.3 Temp= Room Temp,Rated current 1000 hrs	Rdson(Within initial spec limits) Vth(Within initial spec limits) Idss(Within initial spec limits)	22pcs initial	27.73 1.91 6.99	26.14 1.81 2.74	27.09 1.84 4.89					
			Rdson(Within spec limits) Vth(Within spec limits) Idss(Within spec limits)	22pcs final	28.27 1.90 7.02	26.88 1.80 2.76	27.61 1.84 5.36					
	High temperature reverse bias (HTRB)	JEDEC or MIL-STD-750D METHOD 1038.4 Vds=80% VdsMax, Tj as data sheet definitaiton (168,500hr TEST) 168,500 hrs	Rdson(Within initial spec limits) Vth(Within initial spec limits) Idss(Within initial spec limits)	22pcs initial	27.58 1.99 6.13	26.44 1.81 2.44	26.92 1.86 4.25					
			Rdson(Within spec limits) Vth(Within spec limits) Idss(Within spec limits)	22pcs final	28.40 1.99 6.37	26.88 1.80 2.74	27.53 1.86 4.64					
	High temperature storage life	JESD22-A103 (B) or MIL-STD-750D METHOD 1031.5 T=150°C(Max rating) 500 hrs	Rdson(Within initial spec limits) Vth(Within initial spec limits) Idss(Within initial spec limits)	22pcs initial	27.82 2.03 6.62	26.46 1.81 2.38	27.04 1.86 3.92					
			Rdson(Within spec limits) Vth(Within spec limits) Idss(Within spec limits)	22pcs final	28.04 2.02 7.60	26.71 1.80 2.55	27.46 1.86 4.40					
	Temperature humidity bias	IEC749 Ta=85 ºC, RH=85%, V= Vdss 80% 1000 hrs	Rdson(Within initial spec limits) Vth(Within initial spec limits) Idss(Within initial spec limits)	22pcs initial	28.44 1.91 5.52	26.23 1.80 2.83	26.98 1.85 4.05					
			Rdson(Within spec limits) Vth(Within spec limits) Idss(Within spec limits)	22pcs final	28.51 1.90 6.07	26.70 1.79 2.99	27.40 1.84 4.55					
	Thermal Fatigue	JESD22-A104 (B) or MIL-STD-750D METHOD 1051.5 Temp. Dt=150°C,air to air; 3 min on-3 min offc 10000 cycle	Rdson(Within initial spec limits) Vth(Within initial spec limits) Idss(Within initial spec limits)	22pcs initial	27.98 1.91 7.14	26.35 1.79 2.59	27.05 1.85 5.19					
			Rdson(Within spec limits) Vth(Within spec limits) Idss(Within spec limits)	22pcs final	28.95 1.91 7.40	26.87 1.79 2.63	27.64 1.84 5.55					
3	APPLICATION TEST											
	SOLDER HEAT TEST	Temperature 260℃ +0/-5℃ DIP TIME 10 +/- 0.5 sec Recovery:set for 0.5±0.1hours at room temperature,then measure	Electrical characteristics 符合 The specified valure	5pcs								
	SOLDERABILITY TEST	Temperature 235 +/- 5℃ DIP TIME 2.5 +/- 0.5 sec	95 % of the immersed surface is to be coated with the new solder.	5pcs								
	Mechanical strength of lead	tensile force>20N,Reject criteria:<40N	Glass or wire broken (Break/Cracking/missing/seriously deformed/outside specification etc.)	5pcs								

NOTE :

Judgement欄位: 信賴性測試後, 需分別量測其零件特性/電氣特性, 再行判定
附件:信賴性報告

藍色區塊中填入報告讀值,判定結果與附件信賴性報告頁數

新零件承認驗證報告

零件類別: MOSFET

TPV P/N 357G763N100096 Supplier P/N P3710BK Date: 2018/11/29

1. Spec

Parameter	BVdss(V)	Rdson(mΩ)	Vgs(th)	Idss (uA)	Igss(uA)	Gfs	Ciss(pF)	Coss(pF)	Crss(pF)	Qg(nC)	Id pulse (A)	EAS(mJ)
SPEC	100	37	1.8	1	100	30	1049	140	56	23	50	128

2. 常溫實測值 3. 高溫實測值(Ta=125℃)

Test Item	BVdss(V)	Rdson(mΩ)	Vgs(th)	Idss (uA)	Igss(uA)	Gfs	Ciss(pF)	Coss(pF)	Crss(pF)	Qg(nC)	Igss(nA)	Idss(uA)	Rdson(mΩ)	Vgs(th)(V)
Test Condition	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec	follow spec
UP LIMIT	0.00	37.00	2.30	1.00	100.00	36.00	1258.80	168.00	78.40	27.60	100.00	10.00	72.15	1.80
LOW LIMIT	30.00	0.00	1.30	0.00	0.00	24.00	839.20	112.00	33.60	18.40	0.00	0.00	0.00	0.80
QTY/NO.														
1				0.008	3.4	30	1125.18	145.81	62.61	24.13	25.00	0.78	49.30	1.41
2				0.01	4.75	31.72	1126.68	145.88	63.44	24.35	24.52	0.952	48.2	1.44
3				0.009	3.98	29.78	1123.68	144.45	62.81	24.15	26.73	0.702	50.3	1.42
4				0.008	4.43	32.04	1127.71	145.84	62.90	24.63	27.07	0.873	50.4	1.44
5				0.007	4.35	31.21	1129.25	146.34	62.75	24.62	25.88	0.861	49.4	1.45
6				0.007	5.69	30.09	1136.10	146.30	62.56	24.20	27.26	0.818	51.5	1.46
7				0.007	4.26	30.49	1136.80	146.00	61.93	24.24	24.96	0.885	51.7	1.41
8				0.009	3.8	30.7	1125.52	143.13	62.51	24.23	28.42	0.903	51.6	1.44
9				0.008	5.53	29.58	1130.51	145.45	62.81	24.20	26.45	0.991	49.8	1.45
10				0.008	4.55	30.55	1128.69	145.21	61.19	24.13	26.33	0.836	51.7	1.42
11				0.009	4.46	31.6	1130.06	144.05	61.77	24.25	28.11	1.026	49	1.43
12				0.01	4.57	29.85	1132.54	143.56	62.76	24.21	28.08	0.904	50.3	1.44
13	Cpk資料由20lots(20ea/lot)計算			0.009	4.93	30.77	1125.09	145.52	61.45	24.37	26.78	1.039	48.4	1.4
14	(資料列表格於下方)			0.009	5.27	32.11	1134.69	145.21	63.34	24.37	27.43	0.997	49.7	1.44
15				0.011	5.25	31.62	1125.28	146.07	63.43	24.55	24.23	0.737	50	1.4
16				0.007	5.19	31.05	1125.87	145.04	63.29	24.33	27.95	0.731	51.7	1.4
17				0.01	4.44	30.11	1134.83	145.32	61.98	24.42	26.9	0.951	48.3	1.42
18				0.008	5.38	30.04	1122.59	144.90	61.42	24.34	24.81	0.935	49.5	1.46
19				0.008	4.92	30.56	1133.00	145.59	62.09	24.77	28.54	0.887	50	1.42
20				0.008	3.9	30.9	1124.44	145.75	60.44	24.37	27.95	1.046	51.4	1.41
21				0.01	4.95	31.47	1133.12	146.51	62.63	24.21	24.48	0.758	51.1	1.43
22				0.008	3.3	30.76	1125.13	144.38	62.93	24.38	27.77	0.751	49.5	1.41
23				0.009	5.15	30.39	1121.12	145.67	62.49	24.52	24.83	0.902	51.2	1.42
24				0.008	3.4	31.93	1129.07	145.41	63.78	24.52	24.43	0.757	50.3	1.42
25				0.01	4.4	32	1134.61	145.33	62.54	24.34	25.75	1.049	49.6	1.42
26				0.008	5.17	29.74	1125.67	144.95	62.84	24.30	28.23	0.991	48.3	1.44
27				0.008	5.69	30.97	1124.91	145.82	63.05	24.19	25.25	0.801	48.3	1.43
28				0.01	4.32	31.87	1130.89	144.23	63.32	24.45	24.8	1.008	48.9	1.46
29				0.01	3.66	29.93	1121.01	145.97	62.23	24.39	24.3	1.007	48.9	1.41
30				0.009	3.9	30.8	1128.01	146.14	63.02	24.34	27.88	0.912	48.7	1.42
MAX OF MEASURE	113.25	27.60	2.22	0.011	5.69	32.11	1136.80	146.51	63.78	24.77	28.54	1.05	51.70	1.46
MIN OF MEASURE	103.87	23.70	1.78	0.007	3.30	29.58	1121.01	143.13	60.44	24.13	24.23	0.70	48.20	1.40
MEAN(X)	108.59	26.04	1.97	0.01	4.57	30.82	1128.40	145.33	62.54	24.35	26.37	0.89	49.90	1.43
δ	1.84	0.64	0.08	0.00	0.69	0.79	4.49	0.83	0.75	0.16	1.48	0.11	1.17	0.02
CPK	14.274	5.691	1.444	302.233	46.030	2.198	9.690	9.146	7.037	6.826	16.627	28.561	6.360	6.905
原規格上限	0.00	37.00	2.30	1.00	100.00	36.00	1258.80	168.00	78.40	27.60	100.00	10.00	72.15	1.80
計算規格上限	97.58	29.89		0.02	8.71	35.53	1155.32	150.28	67.05	25.30	35.23	1.53	56.90	

新規格														
原規格上限		37.00	2.30	1.00	100.00	36.00	1258.80	168.00	78.40	27.60	100.00	10.00	72.15	1.80
原規格下限	30.00		1.30											0.80
計算規格上限		29.89	2.43	0.02	8.71	35.53	1155.32	150.28	67.05	25.30	35.23	1.53	56.90	1.54
計算規格下限	99.41		1.51											1.32
新規格上限		29.89	2.30	0.02	8.71	35.53	1155.32	150.28	67.05	25.30	35.23	1.53	56.90	1.54
新規格下限	99.41		1.51											1.32

以下測試項目爲TPV參考用

4. 室溫條件, 不加任何散熱片或PCB, 單純爲零件單體,
以表列之各Id值爲輸入條件,待溫昇穩定後或以
30 min.爲止--> 量測 Tc (表面溫度)

5. EAS or UIS (Single Pulse Avalanche) 瞬間擊穿能量至破壞爲止

Test Condition / No	0.1*Idmax	0.3*Idmax	0.5*Idmax	0.7*Idmax
1	49.8	150up	150up	150up
2	50.1	150up	150up	150up
3	49.7	150up	150up	150up
4	48.5	150up	150up	150up
5	49.9	150up	150up	150up
最大值	50.1	0	0	0
最小值	48.5	0	0	0

Test Condition / No	EAS	EAS + 10%	EAS + 20%	EAS + 30%
1	Pass	Pass	Pass	Pass
2	Pass	Pass	Pass	Pass
3	Pass	Pass	Pass	Pass
4	Pass	Pass	Pass	Pass
5	Pass	Pass	Pass	Pass

BVdss(V)

No. / Lot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	109.09	108.03	108.76	109.55	108.61	109.98	105.45	110.27	106.85	108.78	110.27	105.05	106.48	105.32	107.58	105.02	107.84	109.09	110.78	110.51
2	108.79	107.63	109.61	109.25	109.43	108.94	107.89	111.24	103.87	110.39	112.77	106.12	106.48	105.29	108.95	105.63	109.15	109.03	110.96	110.88
3	108.94	109.55	107.87	108.91	110.13	111.05	108.83	110.48	107.31	109.84	110.61	106.24	105.45	106.03	106.7	105.72	107.38	107.47	110.2	110.78
4	108.91	108.24	108.3	110.25	108.33	108.94	107.58	110.39	106.88	109.54	110.06	105.05	105.42	106.6	106.48	105.35	108.63	108.81	110.69	111.39
5	107.87	108.15	107.78	109.89	109.7	109.43	109.35	111.67	107.83	109.48	110.15	106.12	108.13	105.78	107.06	106.82	107.96	108.78	112.24	111.45
6	109.46	107.63	107.66	109.61	110.38	108.91	109.38	109.94	107.62	110.67	109.69	107.09	105.26	105.23	108.98	105.78	108.96	108.6	111.12	111.82
7	109.61	108.3	106.81	109.34	109.64	110.53	108.71	107.2	108.62	109.42	109.9	107	105.69	105.32	106.57	105.66	108.39	108.75	112.15	112.37
8	109.37	108.36	107.75	110.83	109.74	111.96	108.32	110.91	107.62	110.76	110.39	107.06	105.75	106.42	105.93	107	107.84	107.68	111.39	111.91
9	110.01	108.33	109.82	109.46	109.67	109.58	108.96	110.21	108.35	109.02	110.91	105.35	105.26	105.23	105.84	105.63	108.99	109.03	110.99	111.91
10	108.7	108.51	108.7	108.7	109.61	109	108.77	108.02	110.02	110.12	110.67	105.96	107.64	107.85	105.99	105.81	109.24	109.24	112.21	110.72
11	108.51	109.24	107.23	110.59	109.13	109.77	108.99	111.43	107.04	109.42	109.94	106.15	106.12	106.09	107.46	106.91	109.57	108.02	113.25	111.3
12	108.39	109.85	108.12	109.19	109.1	111.2	108.26	109.51	106.82	109.81	108.99	106.7	107.46	105.35	105.75	105.81	109.27	108.63	111.45	110.85
13	107.81	106.53	109.03	109.34	109.43	111.72	108.53	110.21	107.34	109.17	109.42	106.39	106.09	108.07	106.33	105.48	108.29	108.11	111.54	111.55
14	108.39	108.09	107.32	109	110.1	108.3	108.77	109.36	107.22	109.2	110.39	106.18	106.39	105.48	107.12	106.12	107.29	107.23	111.69	110.94
15	108.79	110.01	108.09	109	108.3	109.58	109.57	110.57	107.22	109.39	110.42	105.66	105.84	106.51	106.03	107	108.54	108.35	112.85	110.88
16	109.03	108.27	107.87	109.98	109.06	109.58	108.16	109.57	107.4	109.72	110.18	106.45	107.24	106.24	106.64	108.59	109.42	110.49	111.88	111.33
17	108.45	107.54	108.15	109.03	109.43	110.1	108.56	108.08	106.79	110.36	112.07	105.48	106.88	105.32	106.21	107.31	109.7	109.3	112.64	111.06
18	108.85	109.31	108.88	109.67	108.76	109.52	107.86	108.08	109.66	107.68	110.24	105.66	106.85	107.4	106.09	107.37	109.09	109.45	111.79	110.21
19	109.12	107.48	108.18	109.58	109.19	110.07	108.8	109.84	107.62	110.33	110.67	107.37	106.39	105.84	105.66	106.94	108.84	108.35	110.9	112
20	107.81	108.09	107.32	110.31	110.56	110.28	109.14	109.63	108.01	109.45	110.27	106.24	104.71	105.63	105.69	106.06	109.79	108.93	111.69	111.24

Rdson(mΩ)

No. / Lot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	25.4	24.9	25.4	26.6	25.3	26.3	23.8	25.9	25	24.8	26.1	25.3	25.8	25.4	26.6	25.5	24.8	25.8	26.2	26.3
2	25.6	25.4	26.2	26.7	26.4	25.7	25.6	26.6	23.9	25.3	27.5	26.1	26	25.8	27.6	25.9	25.3	26.1	26.2	26.4
3	25.7	26.2	25.7	26.2	27.2	26.7	26	26.2	25.3	25.1	26.2	26.1	26	26.1	26.3	26.2	24.6	24.7	26.3	26.4
4	25.7	24.8	25.4	26.9	26	25.9	25.6	26	25.5	25.1	25.8	25.9	26	26.4	26.3	25.9	25.1	25.5	26.3	26.7
5	25.6	26	25.5	26.8	26.4	26.5	26.1	26.7	25.6	24.9	26	26.1	27.1	26.2	26.6	26.6	25.2	25.7	27	26.7
6	26	25.5	25	26.7	27	26.1	26.3	25.8	25.6	25.7	25.6	26.6	25.9	25.9	27.4	25.8	25.5	25.6	26.4	26.7
7	26	25.7	24.9	26.6	26.5	26.9	26.5	23.9	26	25.4	25.8	26.6	26.1	25.8	26.4	25.9	25	25.8	27.3	27.2
8	25.7	25.6	25.2	27.1	26.8	27.4	25.7	26.4	25.7	26.2	26.1	27.1	26.3	26.2	26	26.4	25.2	25.3	26.9	26.9
9	26.3	25.6	26	26.5	26.4	26.7	26.5	25.8	26.3	24.9	26.4	25.8	25.4	25.8	26.2	25.7	25.5	26.1	26.4	27
10	25.7	25.4	25.5	26.3	26.4	26.3	25.8	24.4	27	25.5	26	26.2	27	27.1	26.2	26.2	26	26	27.2	26.4
11	25.6	25.7	25.2	26.9	26.2	26.6	25.9	26.5	25.4	25.4	25.8	26.1	26.1	26.3	26.7	26.5	26.1	25.7	27.6	26.8
12	25.4	26.1	25.5	26.3	26.2	27.1	25.8	25	25.4	25.3	25.6	26.4	26.8	26	26.1	26	26	25.9	26.6	26.6
13	25.2	23.7	25.7	26.6	26.5	27.3	25.8	26.2	25.6	25.4	25.7	26.5	26.1	27.3	26.3	25.9	25.3	25.5	26.7	26.7
14	25.6	25.6	25	26.5	27	25.9	26	25.9	25.4	25.3	26	26.3	26.2	25.4	26.7	26.2	25.1	25.2	26.7	26.5
15	25.8	26.3	25.4	26.4	26.2	26.7	26.6	26.1	25.1	25.3	26.2	26.1	26.3	26.4	26.2	26.6	25.8	25.6	27.4	26.6
16	25.9	25.9	25.4	26.9	26.5	26.7	26.1	25.8	25.8	25.4	25.9	26.3	26.8	26.4	26.3	27.5	26.3	26.7	26.7	26.7
17	25.7	25.5	25.4	26.6	26.3	26.8	26	24.4	25.2	25.5	26.9	26.1	26.5	26	26.2	26.6	26.6	26.2	27.2	26.5
18	25.7	26.3	26	26.8	26.1	26.6	25.5	24.4	26.4	24.6	26	26.1	26.7	26.5	26.2	26.9	26	26.1	26.5	26.2
19	25.7	25.6	25.7	26.7	26.3	27	26.3	25.8	25.4	25.8	26.3	26.8	26.3	26.1	25.9	26.6	25.5	25.4	26.6	26.9
20	25.2	25.9	25.1	27	26.7	26.8	25.7	25.1	25.8	25.2	26.2	26.2	24.8	25.9	26.2	25.7	26.3	25.9	27	26.7

Vgs(th)

No. / Lot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	2.178	2.032	2.073	1.823	1.868	1.902	2.116	1.891	1.899	1.999	1.972	2.035	2.017	1.949	1.999	1.982	1.913	1.961	1.894	1.915
2	2.041	2.054	2.028	1.85	1.801	1.861	1.969	1.939	1.925	1.987	1.955	1.908	1.913	2.021	1.948	2.01	1.987	1.975	1.954	1.954
3	2.044	2.062	2.044	1.864	1.861	1.89	2.033	1.96	1.886	2.135	1.994	1.854	1.974	1.975	2.003	1.962	1.955	2.004	1.898	2.001
4	2.107	2.095	2.043	1.874	1.861	1.858	2.01	1.917	1.93	1.99	1.988	1.955	2.026	1.96	1.938	1.928	1.971	1.969	1.925	1.943
5	2.076	2.033	2.045	1.895	1.874	1.871	2.012	1.987	1.874	1.938	1.975	2.013	1.969	1.987	1.984	1.923	1.962	1.961	1.889	1.936
6	2.16	2.086	2.067	1.838	1.863	1.888	1.994	1.903	1.917	2.013	1.95	2.007	1.971	1.943	1.959	2.045	2.115	1.96	1.923	1.978
7	2.068	2.015	2.061	1.87	1.85	1.863	2.014	1.944	1.932	1.972	1.905	2.006	1.941	1.994	1.948	1.929	1.933	2.001	1.925	1.962
8	2.053	2.055	2.04	1.81	1.874	1.85	1.996	1.953	1.936	1.978	1.973	1.949	1.898	1.975	2.021	2.006	2.005	1.989	1.918	1.946
9	2.031	2.007	2.013	1.861	1.91	1.909	2.029	1.968	1.969	2.167	1.965	1.961	2.002	1.907	1.989	2.011	1.897	1.954	1.885	1.949
10	2.062	2.017	2.056	1.819	1.782	1.896	2.054	1.922	1.931	1.972	1.949	1.986	1.96	1.928	1.982	1.931	2.002	1.972	1.952	1.945
11	2.024	2.008	2.057	1.809	1.928	1.898	2.013	2.08	1.918	1.939	1.98	1.962	1.996	1.979	2.125	1.954	1.923	2.016	1.94	1.938
12	2.124	2.05	2.035	1.81	1.862	1.916	1.969	1.96	1.876	1.955	1.938	1.881	1.972	1.988	2.009	1.968	1.879	1.961	1.951	1.934
13	2.203	2.069	2.01	1.824	1.883	1.821	2.129	1.883	2.068	1.949	1.925	1.943	1.93	1.971	2.113	2.183	1.964	1.982	1.928	1.896
14	2.059	2.058	2.057	1.862	1.834	1.871	2.009	2.111	1.919	1.938	1.958	2.068	2.022	1.987	2.017	2.05	1.898	2.018	1.9	1.928
15	2.092	2.021	1.994	1.87	1.82	1.873	2.03	1.929	2.014	1.917	1.959	1.937	1.951	1.998	1.925	2.079	1.947	2.002	1.914	1.932
16	2.095	2.025	2	1.843	1.84	1.901	2.035	1.971	1.996	1.933	2.073	1.914	1.981	1.96	2.005	1.941	1.941	1.972	1.889	1.918
17	2.096	2.051	1.994	1.854	1.841	1.875	2.026	1.895	2.224	2.126	1.963	1.921	2.144	1.981	2.102	2.061	1.926	1.983	1.952	1.993
18	2.03	2.027	2.049	1.838	1.873	1.883	2.214	1.895	1.96	2.087	1.947	1.992	1.912	2.034	1.94	1.957	1.986	1.959	1.901	2.156
19	2.066	2.052	2.051	1.828	1.834	1.874	1.999	1.934	1.978	1.986	2.039	1.997	1.983	1.979	1.926	2.052	2.129	1.966	1.956	2
20	2.081	2.017	2.028	1.819	1.93	1.864	2.036	1.953	1.958	1.873	1.962	1.973	2.042	2	2.009	2.031	2.027	1.931	1.912	1.965

P3710BK

Initial - Operation Life

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.809	109.2	1.483	3.262	27.34	30.62	0.754
2	1	1.875	109.2	1.526	4.605	27.29	30.53	0.754
3	1	1.815	108.5	1.811	3.964	26.88	29.95	0.752
4	1	1.838	109.1	2.121	5.216	26.94	30.05	0.751
5	1	1.839	108.1	2.041	4.697	26.61	29.80	0.754
6	1	1.811	109.9	1.661	3.200	27.40	30.49	0.751
7	1	1.856	108.7	2.519	6.988	26.88	30.00	0.752
8	1	1.820	110.4	2.066	5.125	27.47	30.70	0.753
9	1	1.818	109.7	2.106	6.041	27.35	30.63	0.752
10	1	1.837	108.3	2.277	5.674	26.87	30.07	0.749
11	1	1.808	108.6	2.326	4.667	26.89	30.13	0.754
12	1	1.838	108.0	2.384	5.277	26.72	30.01	0.753
13	1	1.851	108.2	2.225	6.163	26.87	30.15	0.754
14	1	1.835	108.1	2.669	6.133	26.83	30.08	0.754
15	1	1.838	109.7	2.682	4.636	27.48	30.65	0.753
16	1	1.854	107.7	2.179	5.766	26.14	29.25	0.755
17	1	1.877	108.6	1.943	4.117	26.92	30.20	0.755
18	1	1.831	109.2	2.265	5.919	27.04	30.43	0.752
19	1	1.906	109.4	2.565	6.010	27.21	30.60	0.755
20	1	1.851	110.3	1.796	2.742	27.73	30.90	0.753
21	1	1.841	110.0	1.802	3.872	27.48	30.66	0.753
22	1	1.837	109.6	1.719	3.567	27.61	30.77	0.758
	Max	1.906	110.4	2.682	6.988	27.73	30.90	0.758
	Min	1.808	107.7	1.483	2.742	26.14	29.25	0.749
	Average	1.840	109.0	2.098	4.893	27.09	30.30	0.753

Initial - High temperature reverse bias (HTRB)

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.860	107.4	2.026	3.200	26.56	29.78	0.754
2	1	1.957	108.1	1.833	3.353	26.60	30.29	0.757
3	1	1.930	109.1	2.023	5.491	27.03	30.51	0.754
4	1	1.858	109.4	1.493	4.300	27.40	30.54	0.752
5	1	1.832	108.9	1.971	4.575	26.98	30.13	0.753
6	1	1.842	108.1	1.784	5.216	26.69	29.89	0.752
7	1	1.902	109.0	1.765	4.056	27.15	30.55	0.756
8	1	1.854	110.6	1.499	4.147	27.58	31.22	0.757
9	1	1.854	107.9	1.627	4.697	26.87	30.14	0.754
10	1	1.855	108.3	1.600	4.544	26.81	30.05	0.751
11	1	1.822	109.3	1.440	2.712	27.18	31.35	0.759
12	1	1.994	107.9	1.327	4.361	26.50	31.04	0.761
13	1	1.899	108.8	1.410	3.017	26.82	30.19	0.756
14	1	1.818	110.3	1.667	4.514	27.52	30.60	0.753
15	1	1.825	109.9	1.462	4.178	27.47	30.53	0.751
16	1	1.811	109.0	1.437	4.941	27.13	30.24	0.750
17	1	1.839	108.1	1.673	4.025	26.76	30.04	0.755
18	1	1.865	108.3	1.793	6.133	26.67	29.90	0.755
19	1	1.868	107.4	1.618	2.437	26.44	29.78	0.756
20	1	1.831	108.1	1.741	4.361	26.81	30.42	0.756
21	1	1.841	107.5	1.732	4.697	26.50	29.86	0.755
22	1	1.849	108.6	1.557	4.453	26.83	29.98	0.754
	Max	1.994	110.6	2.026	6.133	27.58	31.35	0.761
	Min	1.811	107.4	1.327	2.437	26.44	29.78	0.750
	Average	1.864	108.6	1.658	4.246	26.92	30.32	0.755

Initial - High temperature storage life

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.952	108.3	1.946	5.858	26.83	31.43	0.760
2	1	1.820	109.7	1.698	5.186	27.41	30.54	0.754
3	1	1.858	108.2	1.891	4.850	26.84	30.10	0.755
4	1	1.828	108.1	1.778	3.506	26.46	29.70	0.753
5	1	1.846	107.8	1.627	4.605	26.65	29.86	0.754
6	1	1.825	110.0	1.627	2.559	27.50	30.55	0.751
7	1	1.986	109.4	1.903	2.681	26.67	30.24	0.756
8	1	1.807	109.5	1.486	3.078	27.30	30.42	0.751
9	1	1.875	110.0	1.542	2.956	27.82	31.06	0.754
10	1	1.834	109.6	1.652	3.995	27.30	30.56	0.754
11	1	1.848	107.9	1.597	3.170	26.67	29.99	0.756
12	1	1.868	110.0	1.471	2.376	27.17	30.45	0.753
13	1	1.841	108.5	1.499	6.621	26.81	30.04	0.754
14	1	1.815	108.9	1.784	2.437	27.02	30.08	0.753
15	1	1.876	108.9	1.462	2.681	27.10	30.32	0.754
16	1	1.859	108.2	1.355	4.117	26.76	29.90	0.753
17	1	1.812	110.3	1.468	4.178	27.51	30.80	0.755
18	1	1.854	109.2	1.581	4.422	27.22	30.38	0.758
19	1	2.027	109.3	1.306	4.269	27.05	31.12	0.760
20	1	1.861	108.2	1.171	2.956	26.82	30.01	0.754
21	1	1.847	108.2	1.404	3.811	26.61	29.74	0.752
22	1	1.842	109.0	1.465	5.980	27.26	30.42	0.753
	Max	2.027	110.3	1.946	6.621	27.82	31.43	0.760
	Min	1.807	107.8	1.171	2.376	26.46	29.70	0.751
	Average	1.863	109.0	1.578	3.922	27.04	30.35	0.754

Initial - Temperature humidity bias

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.818	108.4	1.395	5.003	26.92	29.98	0.751
2	1	1.839	107.9	1.572	4.575	26.78	29.96	0.754
3	1	1.814	109.4	1.281	3.811	27.40	30.67	0.754
4	1	1.802	109.6	1.775	4.758	27.00	30.27	0.753
5	1	1.860	108.2	1.413	3.811	26.52	29.70	0.754
6	1	1.856	106.9	1.459	3.139	26.23	29.43	0.754
7	1	1.839	109.0	1.536	3.964	27.01	30.13	0.754
8	1	1.830	108.6	1.652	5.522	26.72	29.86	0.754
9	1	1.808	108.9	1.609	4.789	26.88	30.12	0.753
10	1	1.836	107.3	1.790	4.453	26.37	29.53	0.753
11	1	1.819	108.9	1.585	4.025	26.81	30.02	0.753
12	1	1.906	109.6	1.707	2.834	27.33	30.75	0.757
13	1	1.860	109.7	1.958	3.842	28.44	32.37	0.751
14	1	1.829	108.5	1.382	3.231	26.83	30.18	0.755
15	1	1.872	108.3	1.563	3.017	26.90	30.12	0.753
16	1	1.874	109.6	1.732	3.567	27.21	30.44	0.755
17	1	1.876	109.0	1.799	3.078	26.83	30.27	0.755
18	1	1.888	109.9	1.980	3.750	27.49	30.88	0.756
19	1	1.901	109.1	1.805	5.125	27.15	30.76	0.759
20	1	1.822	109.2	1.943	4.361	27.09	30.60	0.758
21	1	1.807	109.6	2.109	5.155	27.00	30.02	0.752
22	1	1.858	107.7	1.965	3.292	26.71	29.93	0.749
	Max	1.906	109.9	2.109	5.522	28.44	32.37	0.759
	Min	1.802	106.9	1.281	2.834	26.23	29.43	0.749
	Average	1.846	108.8	1.682	4.050	26.98	30.27	0.754

Initial - Thermal Fatigue

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.832	109.3	2.007	5.125	27.22	30.45	0.752
2	1	1.869	109.4	2.001	5.125	27.57	30.81	0.753
3	1	1.851	109.1	2.688	6.499	27.39	30.61	0.754
4	1	1.818	109.9	1.906	5.430	27.26	30.30	0.750
5	1	1.844	108.3	2.378	4.972	26.76	29.99	0.753
6	1	1.908	109.1	2.151	3.048	26.95	30.38	0.755
7	1	1.793	109.1	2.130	6.560	27.05	30.11	0.751
8	1	1.841	108.2	2.234	5.980	26.91	30.07	0.753
9	1	1.828	107.8	1.765	6.285	26.67	29.82	0.753
10	1	1.810	108.0	2.106	6.072	26.35	29.42	0.751
11	1	1.852	110.6	1.860	5.338	27.98	31.24	0.753
12	1	1.797	108.6	2.001	7.141	26.84	30.16	0.753
13	1	1.801	108.1	2.121	5.186	26.67	29.87	0.754
14	1	1.901	110.0	1.750	2.590	27.51	30.84	0.756
15	1	1.853	109.2	1.719	3.903	27.37	30.72	0.755
16	1	1.841	110.2	1.989	4.911	27.60	30.81	0.753
17	1	1.876	108.7	1.866	3.139	26.88	30.10	0.753
18	1	1.851	107.5	2.060	5.033	26.68	30.00	0.754
19	1	1.890	110.1	2.225	6.224	27.27	30.79	0.756
20	1	1.841	108.2	2.023	5.613	27.01	30.24	0.753
21	1	1.867	108.1	2.213	5.186	26.59	29.80	0.753
22	1	1.833	107.4	2.121	4.758	26.50	29.69	0.750
	Max	1.908	110.6	2.688	7.141	27.98	31.24	0.756
	Min	1.793	107.4	1.719	2.590	26.35	29.42	0.750
	Average	1.845	108.9	2.060	5.187	27.05	30.28	0.753

Final - Operation Life

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.803	110.1	1.535	3.721	28.20	31.12	0.754
2	1	1.870	109.6	1.785	5.378	27.86	31.47	0.753
3	1	1.812	109.2	2.068	4.058	27.06	30.45	0.751
4	1	1.829	109.2	2.299	5.944	27.39	31.03	0.751
5	1	1.836	108.5	2.322	5.445	26.98	30.50	0.753
6	1	1.805	110.7	1.666	3.234	27.68	31.03	0.751
7	1	1.854	109.2	2.742	7.024	27.64	30.86	0.752
8	1	1.816	110.6	2.429	5.747	28.18	31.52	0.752
9	1	1.811	110.0	2.276	6.734	27.55	31.31	0.751
10	1	1.834	108.5	2.315	6.249	26.98	31.06	0.748
11	1	1.803	109.0	2.846	5.468	27.06	30.33	0.753
12	1	1.829	108.6	2.456	5.471	27.71	30.09	0.753
13	1	1.849	109.1	2.399	6.319	27.78	30.50	0.753
14	1	1.826	108.7	3.053	6.273	27.57	30.88	0.753
15	1	1.836	110.0	3.048	5.390	27.70	31.00	0.753
16	1	1.852	108.2	2.274	6.335	26.88	29.56	0.755
17	1	1.874	108.7	2.137	4.953	27.31	30.69	0.754
18	1	1.827	109.8	2.637	6.775	27.70	30.50	0.752
19	1	1.901	109.6	2.959	6.125	27.99	31.48	0.754
20	1	1.845	111.3	2.031	2.756	28.27	31.44	0.753
21	1	1.838	111.0	2.168	4.713	28.16	31.06	0.752
22	1	1.832	110.0	1.975	3.762	27.84	31.45	0.757
	Max	1.901	111.3	3.053	7.024	28.27	31.52	0.757
	Min	1.803	108.2	1.535	2.756	26.88	29.56	0.748
	Average	1.836	109.5	2.337	5.358	27.61	30.88	0.753

Final - High temperature reverse bias (HTRB)

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.859	107.5	2.311	3.673	27.06	30.20	0.754
2	1	1.949	108.8	2.171	3.982	27.16	31.06	0.756
3	1	1.929	110.1	2.275	5.499	27.95	31.24	0.753
4	1	1.850	109.6	1.594	4.711	28.07	30.66	0.752
5	1	1.823	109.5	2.059	5.553	27.34	30.70	0.752
6	1	1.839	109.0	1.785	5.231	27.66	29.92	0.752
7	1	1.900	109.7	2.075	4.457	28.02	31.05	0.755
8	1	1.851	110.7	1.645	5.042	28.32	31.50	0.756
9	1	1.853	108.4	1.814	5.100	27.03	31.05	0.753
10	1	1.852	108.7	1.789	4.762	27.03	30.90	0.750
11	1	1.818	110.1	1.578	2.945	27.61	32.32	0.759
12	1	1.986	108.8	1.470	4.745	27.27	31.51	0.760
13	1	1.898	109.7	1.571	3.128	27.47	30.42	0.755
14	1	1.813	110.7	1.802	4.964	28.40	31.18	0.753
15	1	1.824	110.6	1.570	4.531	28.29	31.51	0.751
16	1	1.803	109.9	1.562	5.467	27.34	31.13	0.749
17	1	1.837	109.0	1.722	4.290	27.04	31.03	0.755
18	1	1.863	109.2	2.185	6.370	27.14	30.17	0.755
19	1	1.860	107.6	1.761	2.741	26.88	30.06	0.756
20	1	1.823	108.5	1.953	4.777	27.60	31.10	0.755
21	1	1.838	108.1	1.868	4.830	27.17	30.04	0.755
22	1	1.841	109.0	1.887	5.321	27.75	30.02	0.754
	Max	1.986	110.7	2.311	6.370	28.40	32.32	0.760
	Min	1.803	107.5	1.470	2.741	26.88	29.92	0.749
	Average	1.860	109.2	1.839	4.642	27.53	30.85	0.754

Final - High temperature storage life

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.944	108.7	2.076	6.727	27.15	32.19	0.759
2	1	1.812	109.8	1.729	6.123	27.57	30.98	0.753
3	1	1.856	108.9	1.944	5.848	27.52	30.50	0.755
4	1	1.826	108.6	1.805	3.544	27.07	30.30	0.753
5	1	1.839	108.1	1.861	5.166	26.71	30.59	0.754
6	1	1.823	110.1	1.945	2.672	27.96	30.56	0.751
7	1	1.978	110.1	2.207	2.787	27.21	30.31	0.756
8	1	1.799	109.9	1.653	3.240	28.02	31.18	0.750
9	1	1.869	110.4	1.726	3.500	27.91	31.24	0.754
10	1	1.830	109.8	1.754	4.550	27.45	30.90	0.753
11	1	1.843	108.5	1.713	3.734	27.67	30.83	0.755
12	1	1.867	110.7	1.538	2.754	27.97	30.55	0.753
13	1	1.832	108.6	1.594	7.600	27.26	31.03	0.754
14	1	1.810	109.4	1.888	2.550	27.38	30.81	0.753
15	1	1.868	109.0	1.625	3.175	27.32	30.88	0.754
16	1	1.856	108.5	1.460	4.235	26.97	30.05	0.753
17	1	1.806	110.5	1.548	4.801	27.87	30.81	0.755
18	1	1.851	109.6	1.763	5.224	28.04	30.59	0.758
19	1	2.019	110.0	1.481	5.104	27.25	31.80	0.760
20	1	1.852	109.1	1.255	3.353	26.90	30.28	0.754
21	1	1.843	109.1	1.535	4.006	26.98	30.62	0.752
22	1	1.841	109.6	1.639	6.178	27.98	31.05	0.752
	Max	2.019	110.7	2.207	7.600	28.04	32.19	0.760
	Min	1.799	108.1	1.255	2.550	26.71	30.05	0.750
	Average	1.857	109.4	1.715	4.403	27.46	30.82	0.754

Final - Temperature humidity bias

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.810	108.9	1.487	5.187	27.30	30.78	0.751
2	1	1.838	108.8	1.679	4.735	27.12	30.00	0.754
3	1	1.809	110.3	1.369	4.201	27.75	30.83	0.753
4	1	1.793	110.3	1.988	5.134	27.65	30.97	0.752
5	1	1.855	109.1	1.576	4.555	26.70	30.11	0.753
6	1	1.852	107.5	1.627	3.770	26.83	29.77	0.753
7	1	1.835	109.9	1.663	4.294	27.61	30.14	0.753
8	1	1.826	109.4	1.759	6.068	26.85	30.32	0.754
9	1	1.804	109.8	1.704	4.832	27.48	31.06	0.753
10	1	1.827	107.4	1.904	5.364	27.04	30.16	0.753
11	1	1.813	109.9	1.744	4.723	27.56	30.23	0.752
12	1	1.904	110.4	1.892	2.993	27.97	31.66	0.757
13	1	1.852	110.6	2.081	4.646	28.51	32.72	0.750
14	1	1.825	109.5	1.472	3.785	27.01	30.82	0.755
15	1	1.868	108.6	1.689	3.203	27.86	30.17	0.753
16	1	1.869	109.7	1.876	3.872	27.56	30.47	0.754
17	1	1.868	109.4	1.893	3.109	26.98	30.71	0.754
18	1	1.884	110.6	2.196	4.539	27.52	31.30	0.755
19	1	1.891	109.8	1.909	5.967	28.14	31.70	0.758
20	1	1.820	109.5	2.040	5.295	27.27	31.14	0.758
21	1	1.805	109.9	2.207	5.995	27.21	30.54	0.752
22	1	1.852	108.2	2.128	3.749	26.95	30.40	0.749
	Max	1.904	110.6	2.207	6.068	28.51	32.72	0.758
	Min	1.793	107.4	1.369	2.993	26.70	29.77	0.749
	Average	1.841	109.4	1.813	4.546	27.40	30.73	0.753

Final - Thermal Fatigue

Condition		VTH	BVDSS	ISGS	IDSS	RDON	RDON	VFSD
No.	Bin	V	V	nA	nA	mR	mR	V
1	1	1.825	109.6	2.055	5.164	27.95	30.58	0.752
2	1	1.865	109.8	2.349	6.026	27.68	31.79	0.753
3	1	1.843	110.1	3.126	7.400	27.51	31.13	0.753
4	1	1.815	110.5	2.052	5.439	27.50	30.36	0.749
5	1	1.835	109.1	2.446	5.309	27.63	30.48	0.752
6	1	1.906	109.5	2.405	3.323	27.49	31.32	0.754
7	1	1.787	109.9	2.267	6.971	27.92	30.52	0.750
8	1	1.833	109.1	2.549	6.306	27.74	31.01	0.753
9	1	1.822	108.2	2.036	6.415	27.51	30.12	0.752
10	1	1.806	108.2	2.366	6.166	27.16	29.96	0.751
11	1	1.845	111.4	2.008	5.514	28.95	31.73	0.753
12	1	1.794	109.2	2.238	7.282	27.31	31.00	0.753
13	1	1.795	108.4	2.273	5.612	27.17	30.77	0.753
14	1	1.897	110.1	1.985	2.626	27.96	31.06	0.756
15	1	1.848	109.5	1.754	4.228	28.14	31.47	0.755
16	1	1.832	111.0	2.050	5.189	28.22	31.68	0.752
17	1	1.867	109.1	2.097	3.202	27.07	30.90	0.753
18	1	1.847	107.8	2.249	5.368	26.87	30.40	0.753
19	1	1.888	110.2	2.310	7.042	27.58	31.25	0.756
20	1	1.834	108.4	2.105	6.066	27.77	30.69	0.752
21	1	1.862	108.3	2.596	6.105	27.56	30.46	0.752
22	1	1.824	108.0	2.268	5.373	27.41	30.32	0.749
	Max	1.906	111.4	3.126	7.400	28.95	31.79	0.756
	Min	1.787	107.8	1.754	2.626	26.87	29.96	0.749
	Average	1.840	109.3	2.254	5.551	27.64	30.86	0.753

环境管理物质不使用证书

（原材料及原材料厂家 LIST）

向贵司销售的零部件及组件的使用材料、包装材料等中未使用 TPV 要求（RDEMS-01）的管理物质（禁止使用对象）及其用途，特此证明。
且：零部件及组件的使用在材料，由以下成分构成。特此报告

1. 零件料号：P3710BK

以下清单所列均质原材料为本产品中所用到的所有原材料

ITEM	Raw Material	Raw Material Supplier	Cd	Pb	Cr^{6+}	Hg	PBB/PBDE	Cl	Br	PAHs	第三方测试报告号码
			含量(ppm)	含量(ppm)	含量(ppm)	含量(ppm)	含量(ppm)	含量(ppm)	含量(ppm)	含量(ppm)	
1	Die	Vanguard	<2	<2	<8	<2	<5	<50	<50	N/A	CE/2018/23813
2	Lead Frame	ASM	<2	29.4	<0.1	<2	<5	<50	<50	N/A	KA/2018/A1816
3	Solder	Heraeus	<2	854540	<0.1	<2	<5	N/A	N/A	N/A	SHAEC1819154407
4	Al Wire	AMETEK	<2	<2	<0.1	<2	<5	<50	<50	N/A	CRSSA/01754/18
5	Cu Wire	Heraeus	<2	<2	<0.1	<2	<5	<50	<50	N/A	SHAEC1815031301
6	Au Wire	Heraeus	<2	<2	<0.1	<2	<5	<50	<50	N/A	SHAEC1815028027
7	Molding Compound	Chang Chun	<2	<2	<8	<2	<5	88.9	<50	N/A	CE/2018/24869
8	Tin ball	AISEN	<2	23	<0.1	<2	<5	<50	<50	N/A	SHAEC1823815201

2、 ICP 测试对象物质（塑料（含橡胶）涂料、油墨和线材料中的镉和铅）测试要求的 ICP 数据另附。ICP 测试对象物质的成分表或 MSDS 另附。

备注：请填写该类零部件用到的所有部件、原材料、辅助材料的详细信息。

必须详细、正确的填写部件、原材料、辅助材料的供应商名称、材料型号

主管/职位: 李沈奎 /品保經理

公司全称: 尼克森微電子股份有限公司

公司公章: