NIKO-SEM

P-Channel Logic Level Enhancement Mode Field Effect Transistor

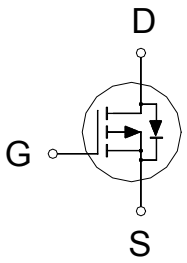
PK5A7BA

PDFN 5x6P

Halogen-Free & Lead-Free

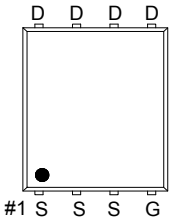
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-20V	3.5mΩ	-108



Features

- Pb−Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.



G. GATE
D. DRAIN
S. SOURCE

100% UIS Tested
100% Rg Tested

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current[4]	T_C = 25 °C	I_D	-108	A
	T_C = 100 °C		-68	
	T_A = 25 °C		-24	
	T_A = 70 °C		-19	
Pulsed Drain Current[1]		I_{DM}	-200	
Avalanche Current		I_{AS}	-53	
Avalanche Energy	L = 0.1mH	E_{AS}	140	mJ
Power Dissipation[3]	T_C = 25 °C	P_D	69	W
	T_C = 100 °C		27	
	T_A = 25 °C		3.5	
	T_A = 70 °C		2.2	
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]	t ≦10s	$R_{\theta JA}$		35	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		50	
Junction-to-Case	Steady-State	$R_{\theta JC}$		1.8	

[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. The value in any given application depends on the user's specific board design.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.
[4]Package limitation current is 50A.

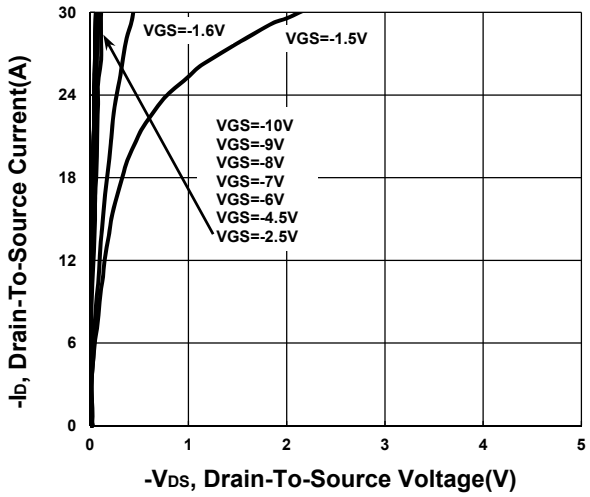
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

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	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.6	-0.7	-1.1	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			-1	uA
		V_{DS} = -10V, V_{GS} = 0V, T_J = 125 °C			-10	uA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -20A		2.6	3.5	mΩ
		V_{GS} = -4.5V, I_D = -20A		3.1	4	mΩ
		V_{GS} = -2.5V, I_D = -20A		4.3	5.7	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -20A		50		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz		6383		pF
Output Capacitance	C_{oss}			927		pF
Reverse Transfer Capacitance	C_{rss}			793		pF
Gate Resistance	Rg	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		3		Ω
Total Gate Charge[2]	Q_g	V_{DS} = -10V, V_{GS} = -10V , I_D = -20A		161		nC
Gate-Source Charge[2]	Q_{gs}			6.3		nC
Gate-Drain Charge[2]	Q_{gd}			21		nC

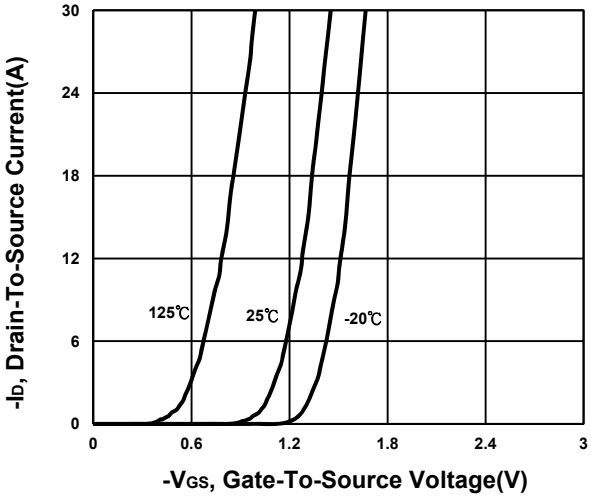
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -10V, $I_D \cong$ -20A, V_{GS} = -10V, R_{GS} = 6Ω		13		nS
Rise Time[2]	t_r			12		
Turn-Off Delay Time[2]	$t_{d(off)}$			350		
Fall Time[2]	t_f			136		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-53	A
Forward Voltage[1]	V_{SD}	I_F = -20A, V_{GS} = 0V			-1.3	V
Reverse Recovery Time	t_{rr}	I_F = -20A , dI_F/dt = 100 A / μS		75		nS
Reverse Recovery Charge	Q_{rr}			61		nC

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

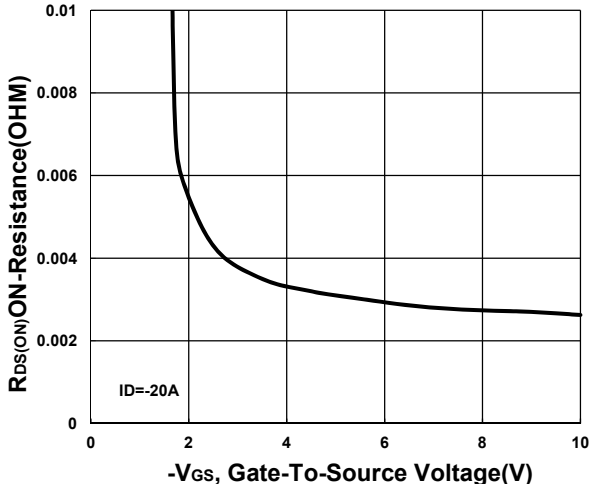
Output Characteristics



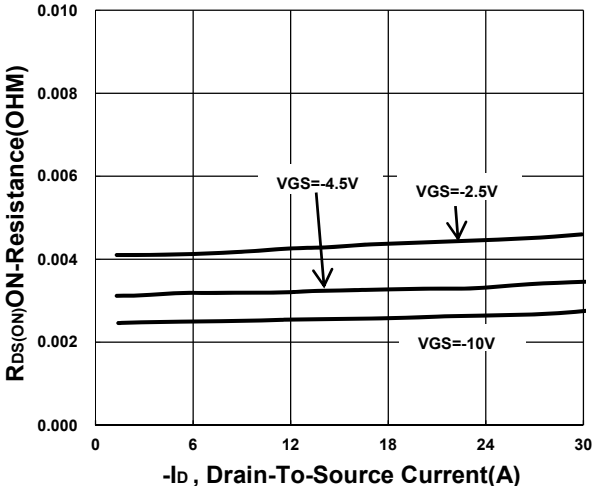
Transfer Characteristics



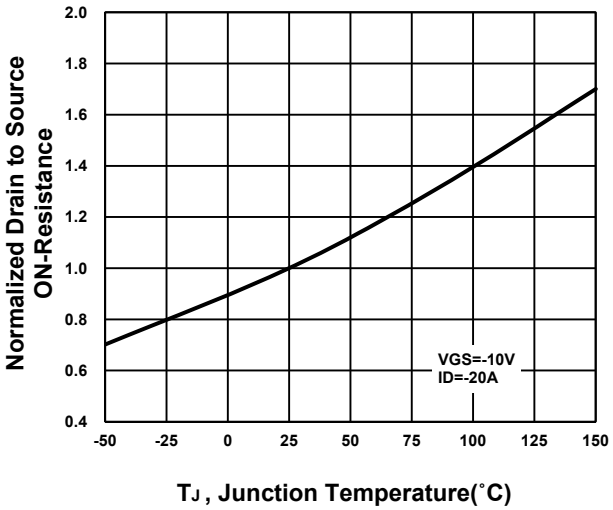
On-Resistance VS Gate-To-Source



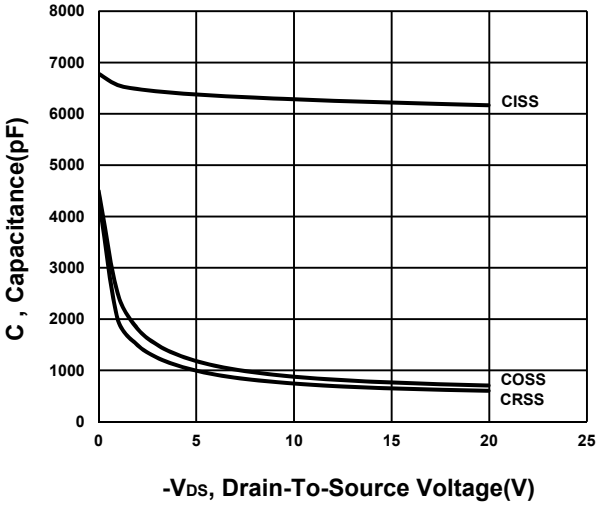
On-Resistance VS Drain Current



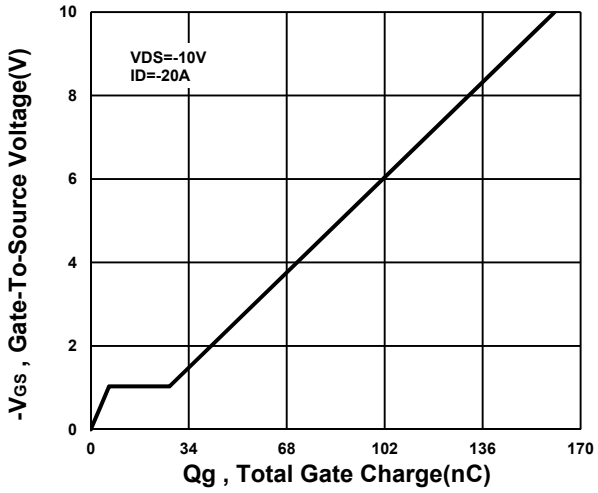
On-Resistance VS Temperature



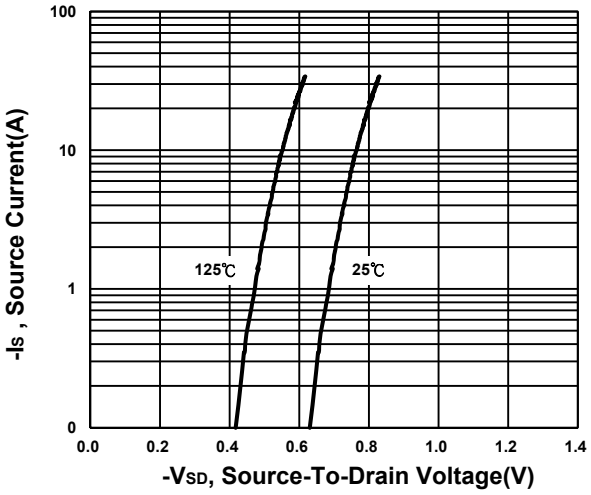
Capacitance Characteristic



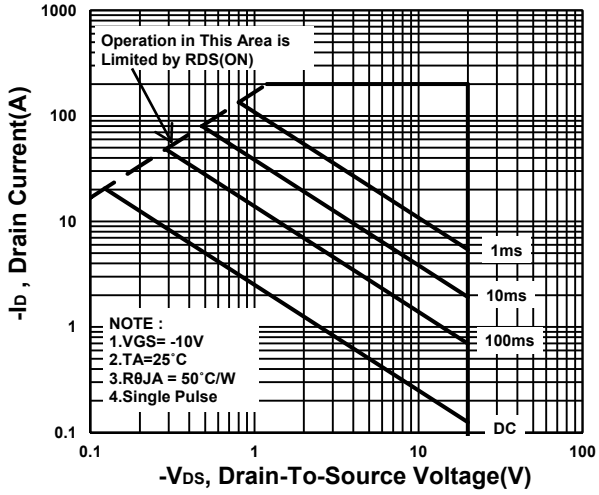
Gate charge Characteristics



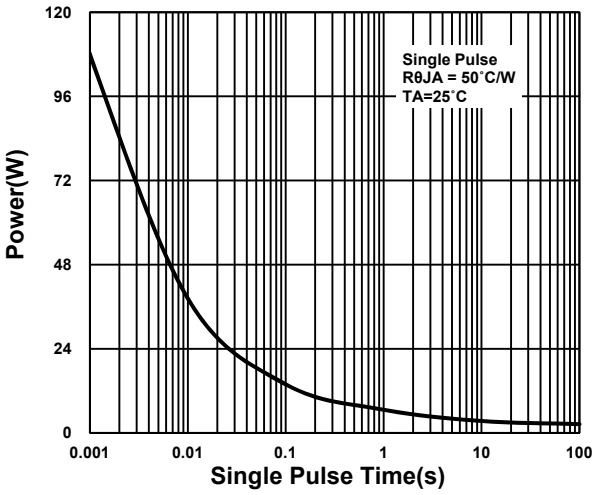
Source-Drain Diode Forward Voltage



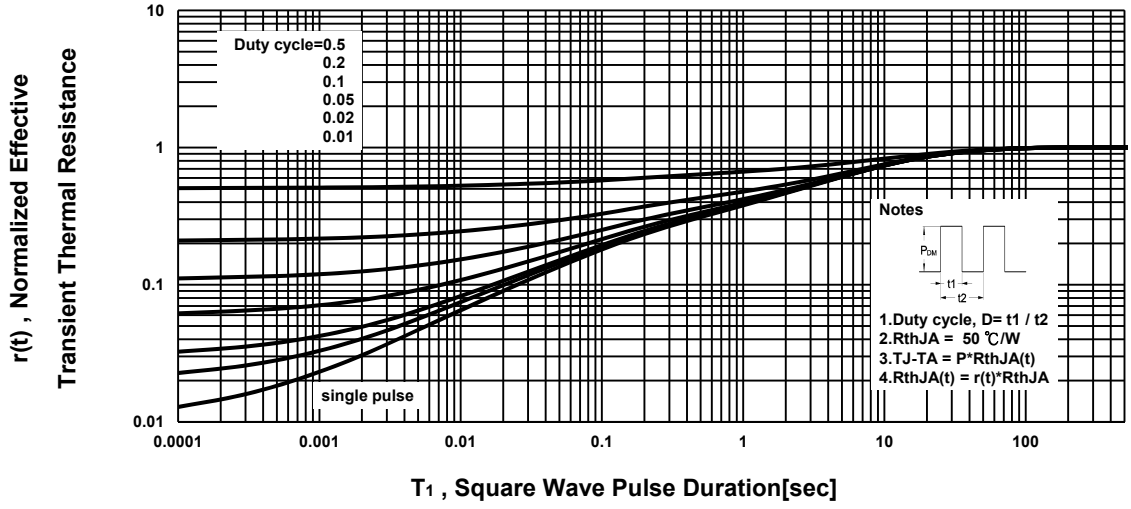
Safe Operating Area



Single Pulse Maximum Power Dissipation



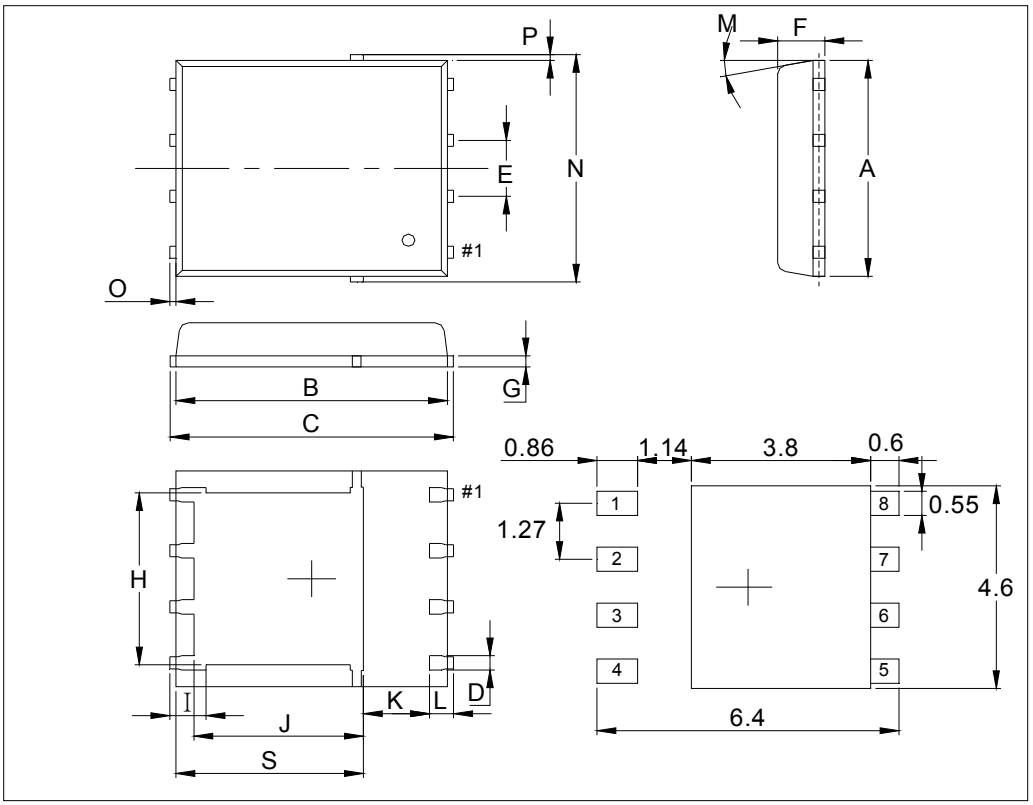
Transient Thermal Response Curve



Package Dimension

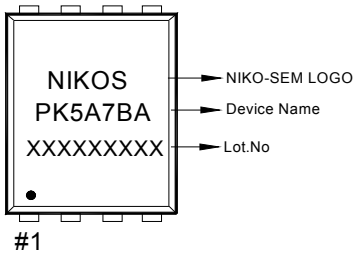
PDFN 5x6P MECHANICAL DATA

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				

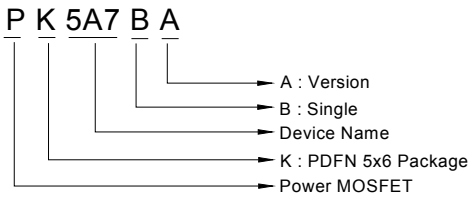


Marking Information:(Please see the corresponding data sheet)

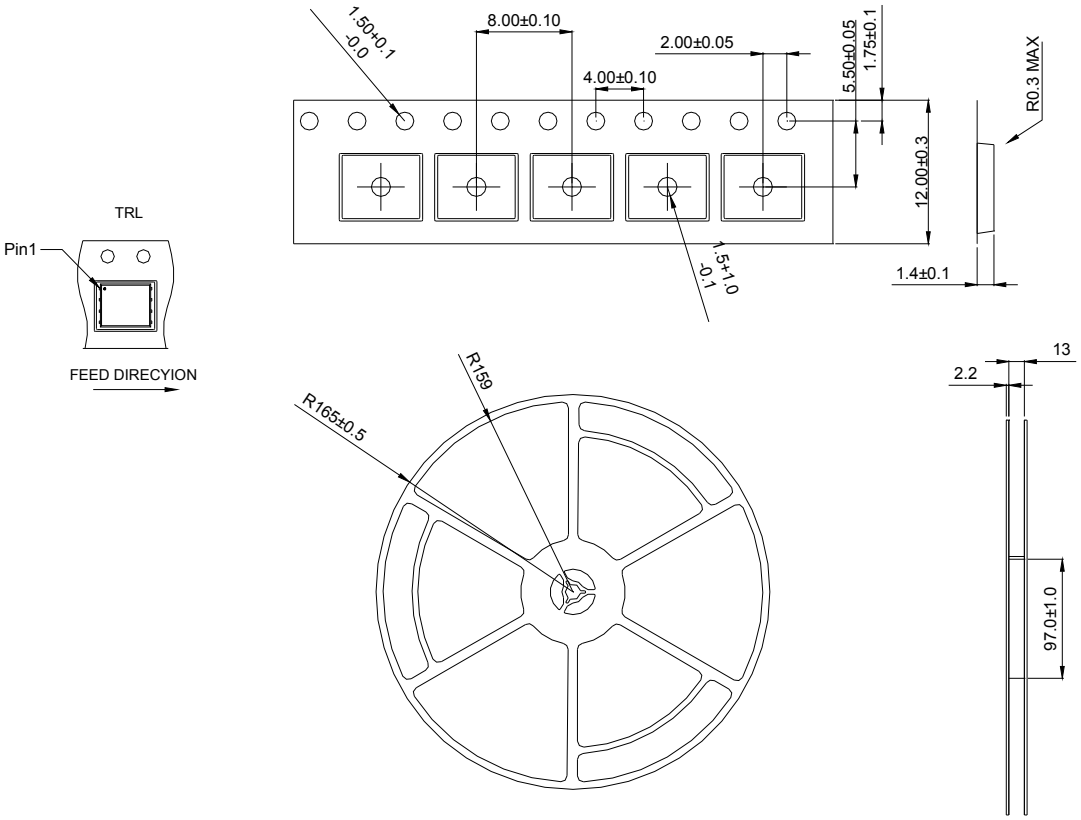
1.零件Marking 文字面說明



2.零件 Part number 說明



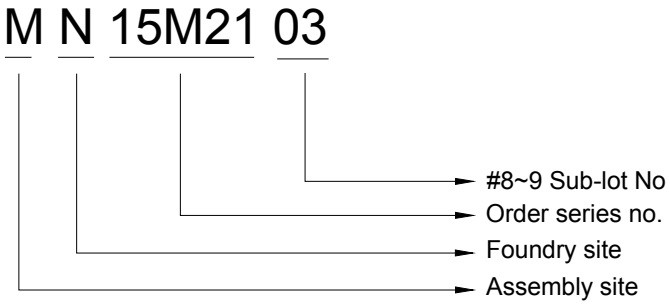
Tape&Reel Information:3000pcs/Reel



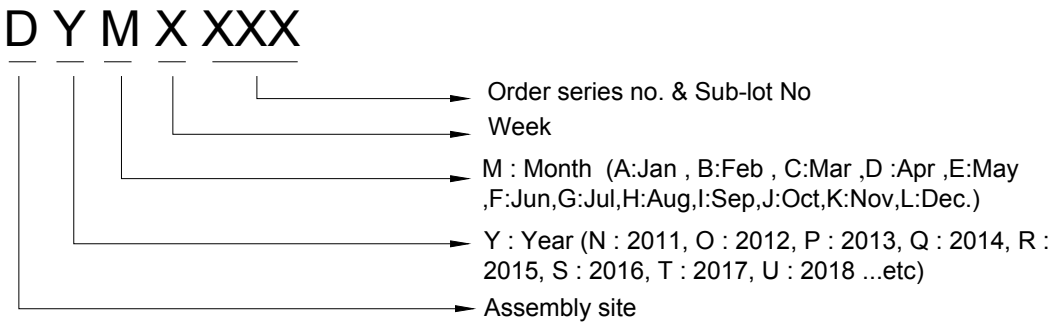
附註:All Dimension in milimeter

Lot.No. & Date Code rule

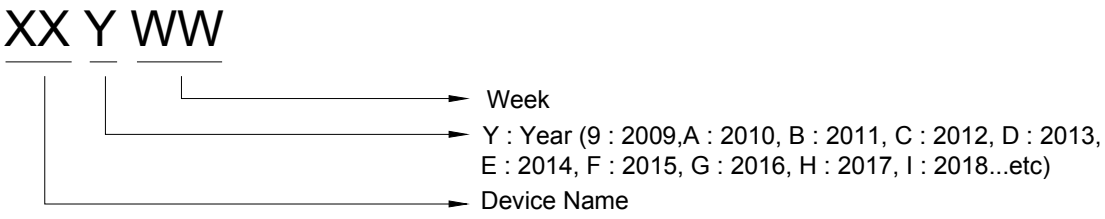
1.LOT.NO.



2.Date Code

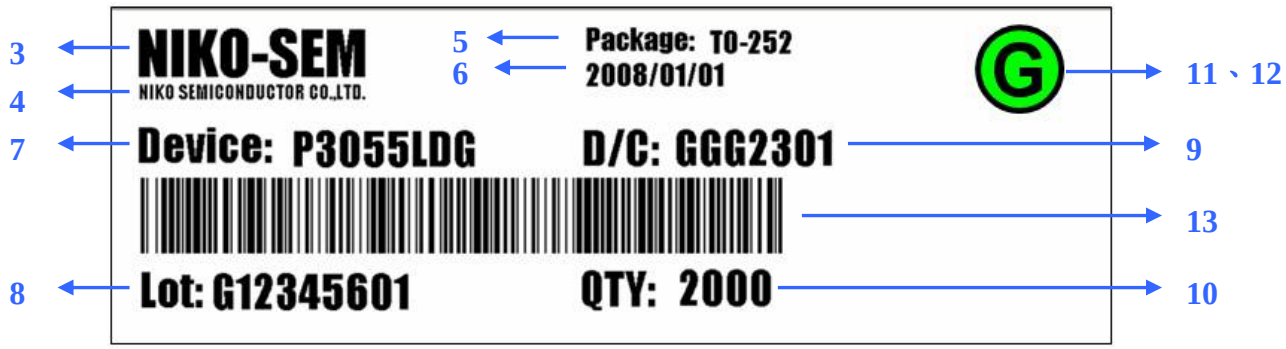


3.Date Code (for Small package)



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

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