UNIKC
Semiconductor

RoHS Compliant

P6503FM
P-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-30V	65mΩ @V_{GS} = -4.5V	-3.6A

SOT-23
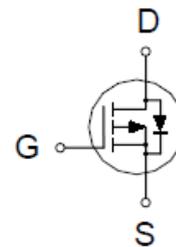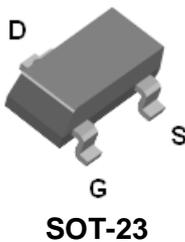
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±12	
Continuous Drain Current	T_A = 25 °C	I_D	-3.6	A
	T_A = 70 °C		-3	
Pulsed Drain Current[1]		I_{DM}	-19	
Avalanche Current		I_{AS}	-19	
Avalanche Energy	L = 0.1mH	E_{AS}	18	mJ
Power Dissipation	T_A = 25 °C	P_D	1	W
	T_A = 70 °C		0.5	
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	$R_{\theta JA}$		130	°C / W

[1]Pulse width limited by maximum junction temperature.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250µA	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250µA	-0.45	-0.97	-1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V, V_{GS} = 0V			-1	µA
		V_{DS} = -20V, V_{GS} = 0V , T_J = 55 °C			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-19			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -2.5V, I_D = -1A		72	80	mΩ
		V_{GS} = -4.5V, I_D = -3.3A		51	65	
		V_{GS} = -10V, I_D = -3.6A		43	50	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -3.3A		14		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		998		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			81		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		12.3		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -4.5V, I_D = -3.3A		10.8		nC
Gate-Source Charge[2]	Q_{gs}			2.1		
Gate-Drain Charge[2]	Q_{gd}			3.8		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -15V $I_D \cong$ -3.3A, V_{GS} = -4.5V, R_{GS} = 6Ω		40		nS
Rise Time[2]	t_r			110		
Turn-Off Delay Time[2]	$t_{d(off)}$			25		
Fall Time[2]	t_f			12		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICE (T_J = 25 °C)						
Continuous Current	I_S				-0.9	A
Forward Voltage[1]	V_{SD}	I_F = -2.3A, V_{GS} = 0V			-1.1	V
Reverse Recovery Time	t_{rr}	I_F = -2.3A, dI_F/dt = 100 A / µs		13.8		nS
Reverse Recovery Charge	Q_{rr}			5		nC

[1]Pulse test : Pulse Width $\leq$ 300 µsec, Duty Cycle $\leq$ 2%.

[2]Independent of operating temperature.

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Output Characteristics

On-Resistance VS Drain Current

On-Resistance VS Gate-To-Source

On-Resistance VS Temperature

Transfer Characteristics

Gate charge Characteristics

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Capacitance Characteristic

Body Diode Forward Voltage VS Source current

Safe Operating Area

NOTE:
1. V_{GS}=10V
2. T_A=25℃
3. $R_{\theta JA}$=130℃/W
4. Single Pulse

Single Pulse Maximum Power Dissipation

SINGLE PULSE
$R_{\theta JA}$ = 130°C/W
T_A=25°C

Transient Thermal Response Curve

Notes
1. Duty cycle, D= t1 / t2
2. RthJA =   130℃/W
3. TJ-TA = P*RthJA(t)
4. RthJA(t) = r(t)*RthJA

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Package Dimension

SOT-23   MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A		1.05		H	0.1		0.2
B	2.4		3	I	0.3		0.6
C	1.4		1.73				
D	2.7		3.1				
E	1		1.31				
F	0		0.15				
G	0.3		0.5				

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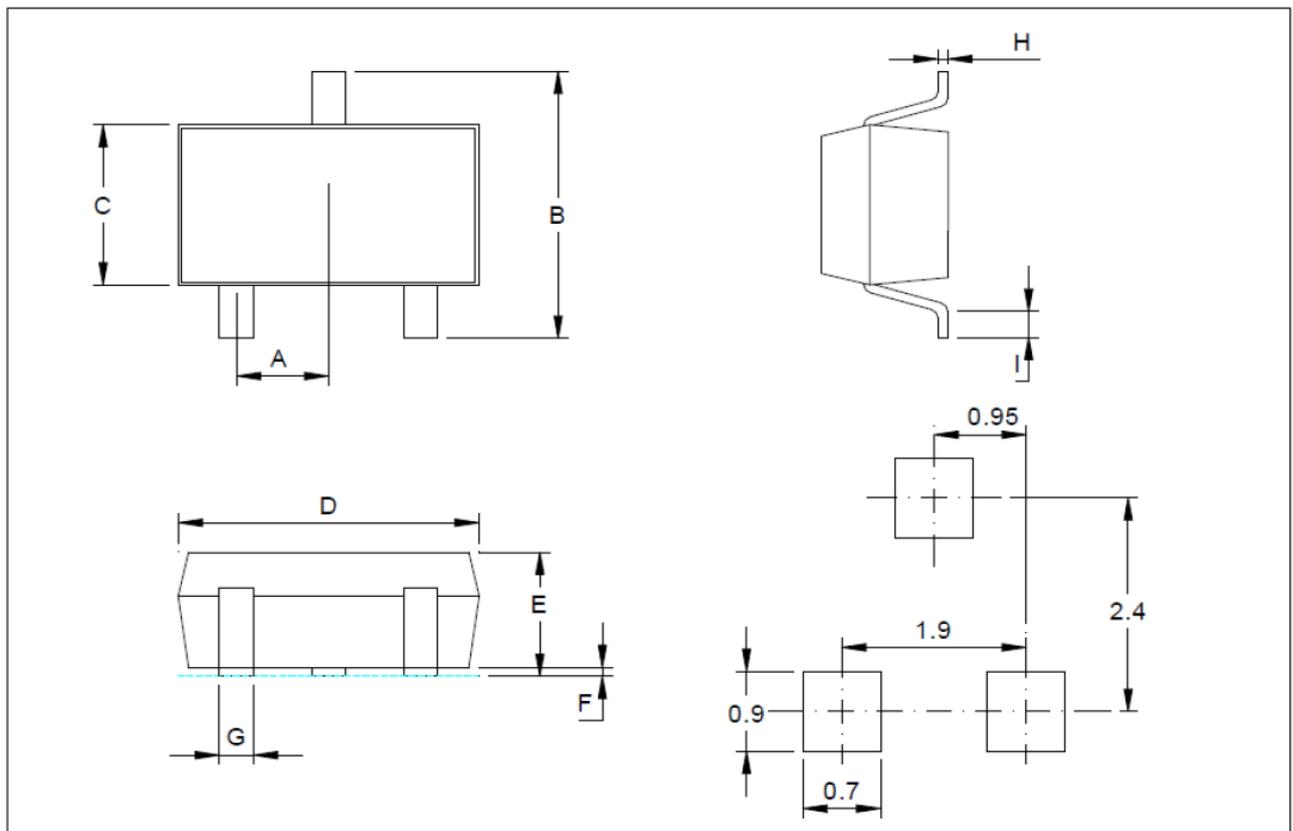
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A. Marking Information（此产品代码为：2K）

DRAIN
3

XXYWW

XX:产品代码
Y : year
WW : week

Lead-free

1
GATE

2
SOURCE
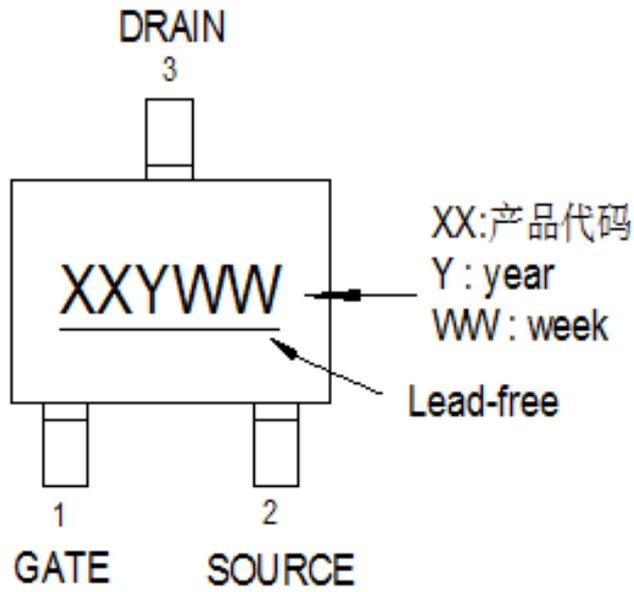
B. Tape&Reel Information:3000pcs/Reel

FEED DIRECTION

2.0 ±0.05

1.55 ±0.05

3.50 ±0.05

13.5 MAX

8.00 ±0.3

8 MAX

1.4max

1.0 ±0.25

4.00 ±0.1

9.0 ±0.3

180 ±1

φ160

φ 60 ±1

11.4 ±1
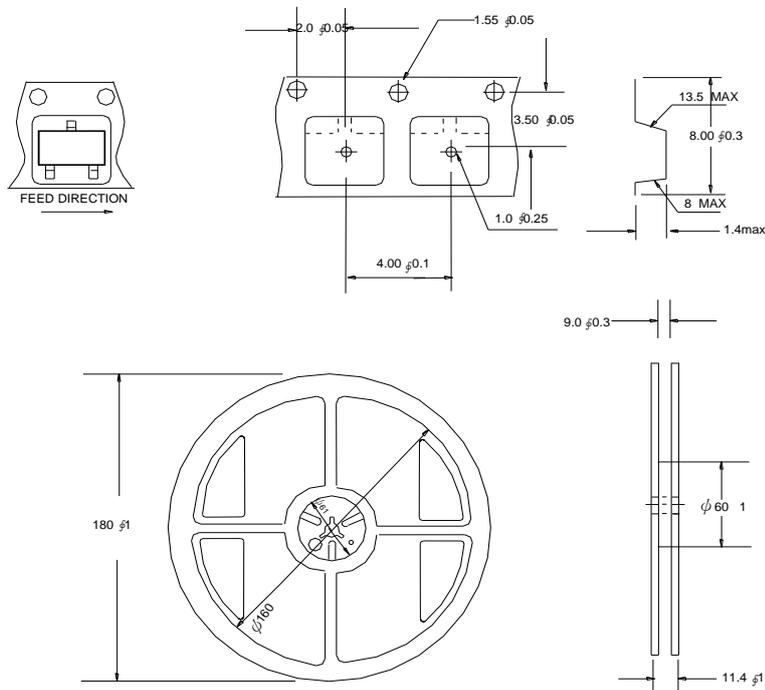
C. Lot No.&Date Code rule

1.Lot No.

<u>M</u> <u>N</u> <u>XXXXX</u> <u>XX</u>

→ Sub-lot No

→ Order series no.

→ Foundry site

→ Assembly site

2.Date Code

<u>D</u> <u>Y</u> <u>M</u> <u>X</u> <u>XXX</u>

→ Order series no.& Sub-lot No

→ Week

→ Month (A:Jan ,B:Feb ,C:Mar ,D:Apr ,E:May, F:Jun,G:Jul,H:Aug,I:Sep,J:Oct,K:Nov,L:Dec)

→ Year (N:2011 ,O:2013 ,P:2014 ,R:2015 , S:2016 ,T:2017 ,U:2018…etc)
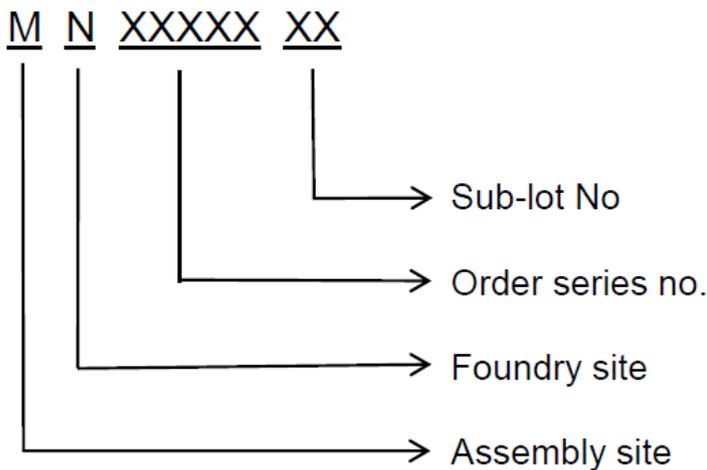
→ Assembly site
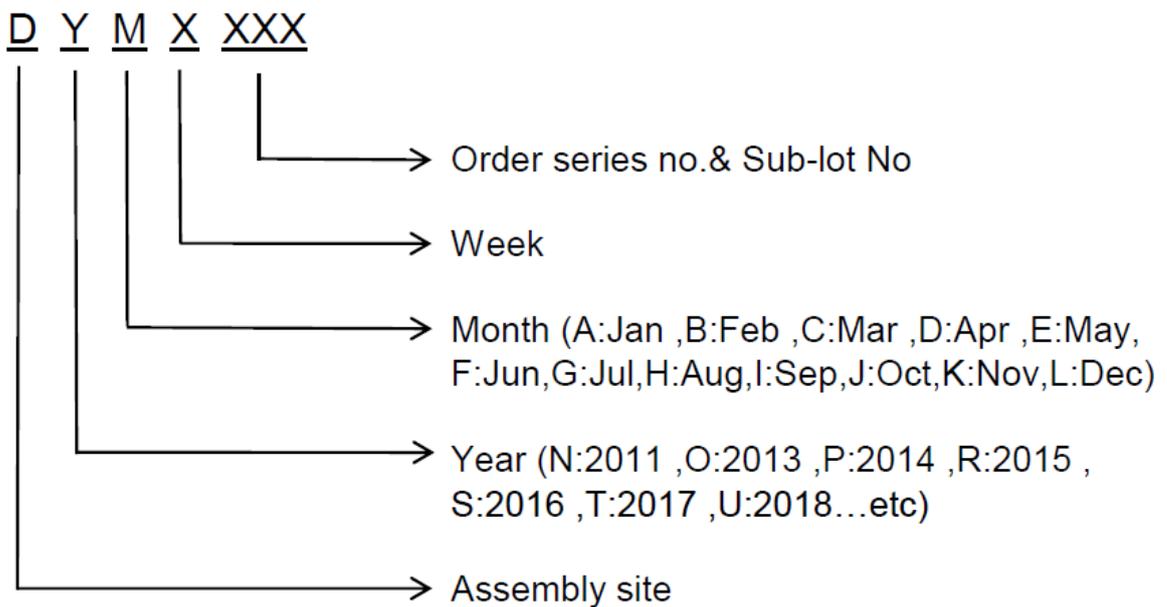
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D.Label rule

标签内容(Label content)

1	Label Size	30 * 90 mm
2	Font style	Times New Roman or Arial （或可区分英文"O"和数字"O"，"G 和"Q"的字型即可）
3	Great Power	Height: 4 mm
4	Package	Height: 2 mm
5	Date	Height: 2 mm Shipping date: YYYY/MM/DD, ex. 2008/09/12
6	Device	Height: 3 mm (Max: 16 Digit)
7	Lot	Height: 3 mm (Max: 9 Digit) Sub lot
8	D/C	Height: 3 mm (Max: 7 Digit)
9	QTY	Height: 3 mm (Max: 6 Digit) Thousand mark is no needed
10	Pb Free label	Diameter: 1 cm bottom color: Green Font color: Black Font style: Arial
11	Halogen Free label	Diameter: 1 cm bottom color: Green Font color: Black Font style: Arial
12	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