Features

- Input Voltage up to 12V
- MOSFET Turn on Resistor RSS(ON) =3.1mohm(Max)@Vgs=4.5V
- Drain to Drain MOSFET Module
- With ESD Protection
- Continuous Current=20A
- Green Product (RoHS, Lead-Free, Halogen-Free Compliant)

General Description

The GS95B5CS-R drain to drain connected MOSFET module provides an integrated solution with small dimension for battery pack of Mobile phone and electronic bracelet application.

Applications

- Mobile phone
- Electronic Bracelet

Typical Application

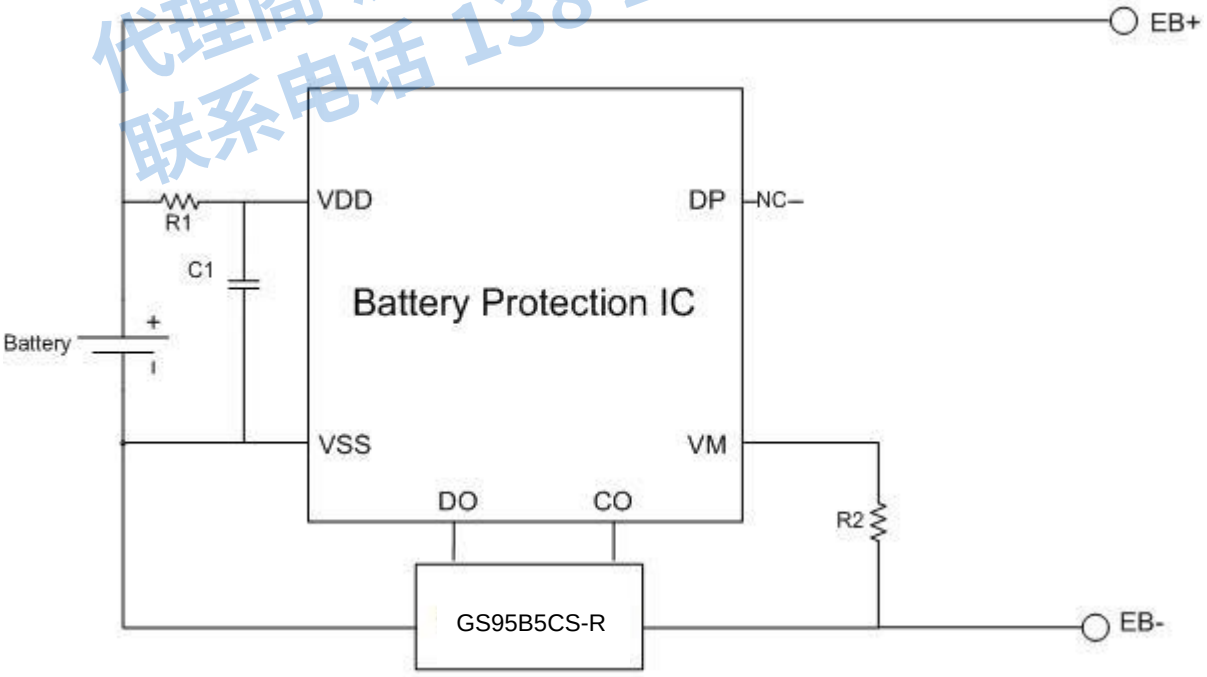


Figure 1 Application of GS95B5CS-R used in battery pack

Function Block Diagram

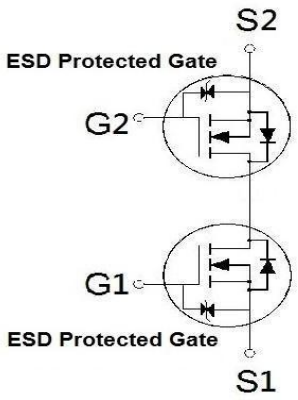


Figure 2 Function Block Diagram

Pin Configuration

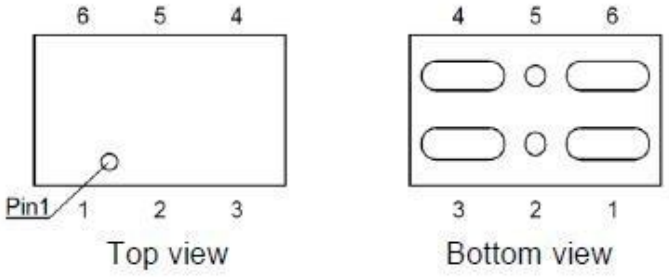


Figure 3 WLCSP 1.77x3.05

Pin Descriptions

No.	Name	I/O type	Description
1	S1	I/O	Source1
2	G1	I	Gate1
3	S1	I/O	Source1
4	S2	I/O	Source2
5	G2	I	Gate2
6	S2	I/O	Source2

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

PARAMETER / TEST CONDITIONS	SYMBOL	LIMITS	UNITS
Source-Source Voltage	V_{SSS}	12	V
Gate-Source Voltage	V_{GSS}	±8	V
Continuous Source Current	I_S	20	A
Pulsed Source Current[1]	I_{SP}	100	A
Total Dissipation[2]	P_T	1.8	W
Operating Junction & Storage Temperature Range	Tj & Tstg	-55~150	°C

Thermal Characteristics

PARAMETER / TEST CONDITIONS	SYMBOL	Typical	UNITS
Thermal Resistance[2]	$R_{\theta JA}$	45	°C / W

[1]PW≤10μs, duty cycle≤1%.

[2]When mounted on 45mmx48mm FR-4 board.

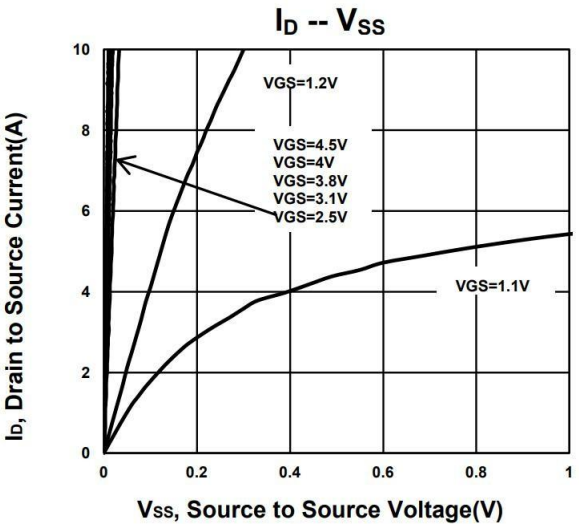
Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

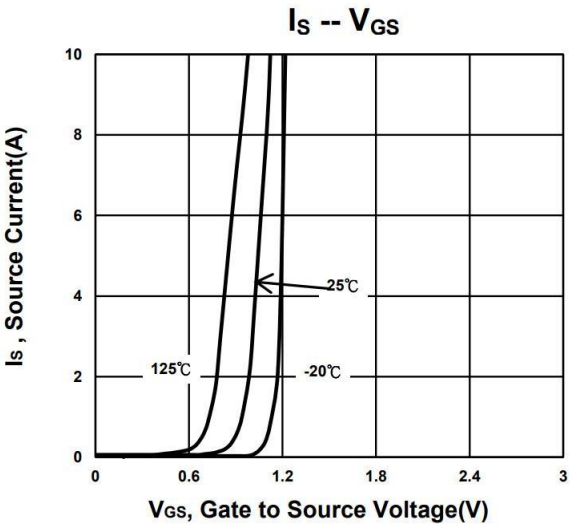
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Source-Source Breakdown Voltage	$V_{(BR)SSS}$	V_{GS} = 0V, I_S =1mA	12			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{SS} = 10V , I_S = 1mA	0.5	0.9	1.3	V
Gate-Source Leakage	I_{GSS}	V_{SS} = 0V, V_{GS} = ±8V			±10	uA
		V_{SS} = 0V, V_{GS} = ±5V			±2	uA
Zero Gate Voltage Source Current	I_{SSS}	V_{SS} = 12V , V_{GS} = 0V			1	uA
Source-Source On-State Resistance[1]	$R_{SS(ON)}$	V_{GS} = 4.5V, I_S = 3A		2.2	3.1	mΩ
		V_{GS} = 3.8V, I_S = 3A		2.4	3.5	mΩ
		V_{GS} = 3.1V, I_S = 3A		2.8	4.6	mΩ
		V_{GS} = 2.5V, I_S = 3A		3.4	6.5	mΩ

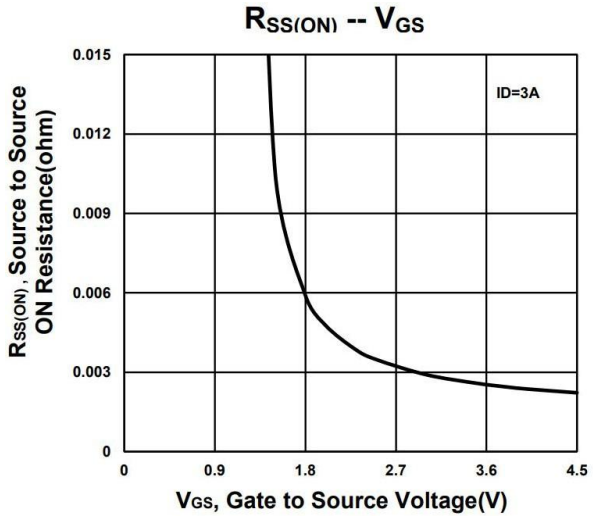
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 6V, f = 1MHz		3426		pF
Output Capacitance	C_{oss}			498		
Reverse Transfer Capacitance	C_{rss}			343		
Total Gate Charge[2]	Q_g	V_{SS} = 6V , V_{GS} = 4.5V， I_S =3A		30		nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{SS} = 6V, $I_S \cong$ 3A,V_{GS} = 4.5V		1.46		uS
Rise Time[2]	t_r			4.25		
Turn-Off Delay Time[2]	$t_{d(off)}$			6.18		
Fall Time[2]	t_f			11.9		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Forward Source-Source Voltage[1]	V_F	I_S = 3A, V_{GS} = 0V		0.65	1.2	V

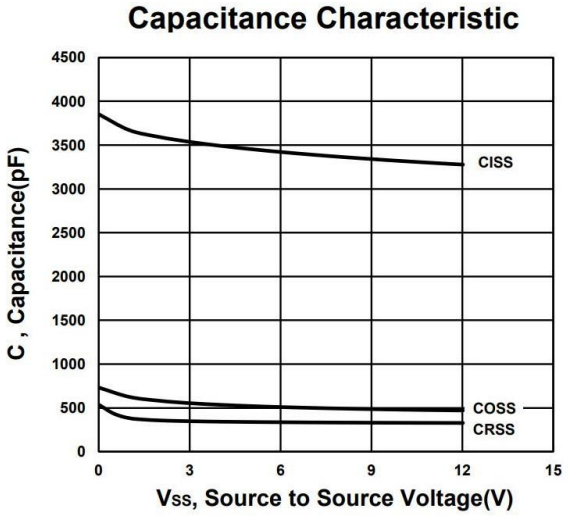
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

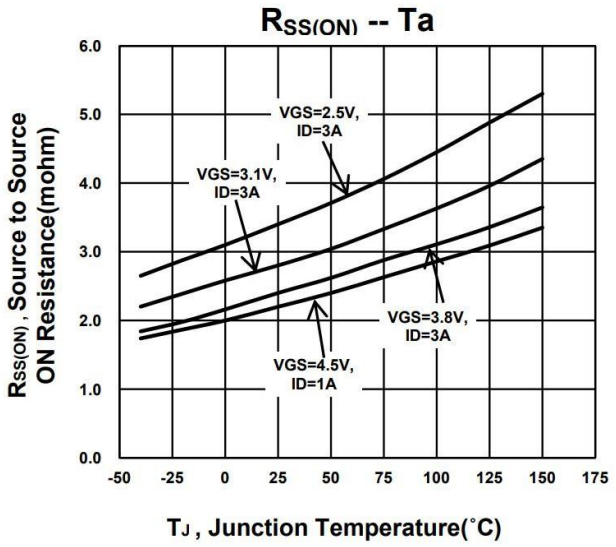
[2]Independent of operating temperature.

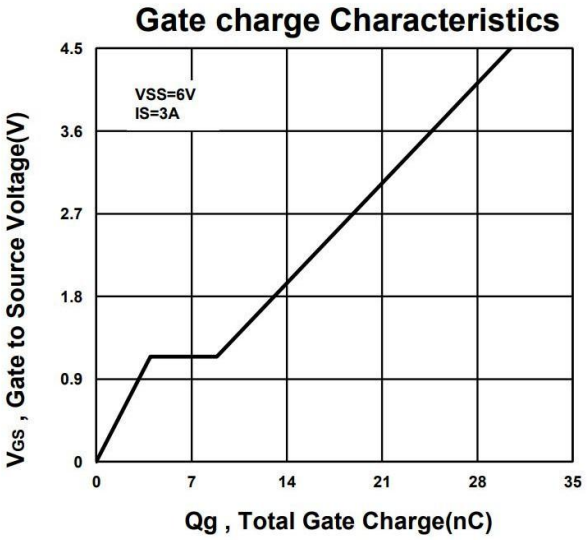

I_D -- V_{SS}
I_D, Drain to Source Current(A)
V_{SS}, Source to Source Voltage(V)
VGS=1.2V
VGS=4.5V
VGS=4V
VGS=3.8V
VGS=3.1V
VGS=2.5V
VGS=1.1V
0
2
4
6
8
10
0
0.2
0.4
0.6
0.8
1

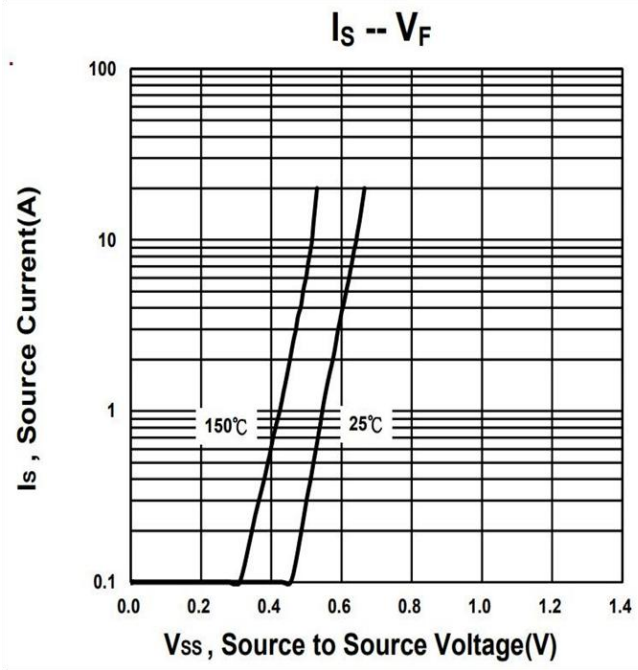

I_S -- V_{GS}
I_S , Source Current(A)
V_{GS}, Gate to Source Voltage(V)
25℃
125℃
-20℃
0
2
4
6
8
10
0
0.6
1.2
1.8
2.4
3

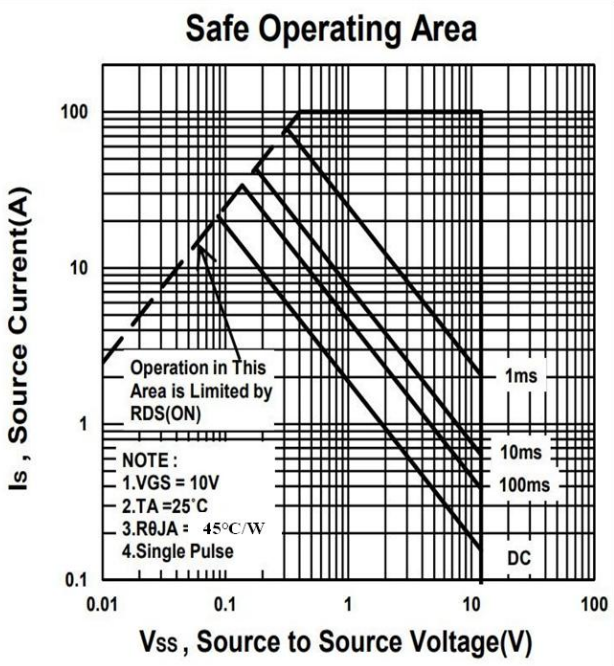

$R_{SS(ON)}$ -- V_{GS}
$R_{SS(ON)}$, Source to Source ON Resistance(ohm)
V_{GS}, Gate to Source Voltage(V)
ID=3A
0
0.003
0.006
0.009
0.012
0.015
0
0.9
1.8
2.7
3.6
4.5

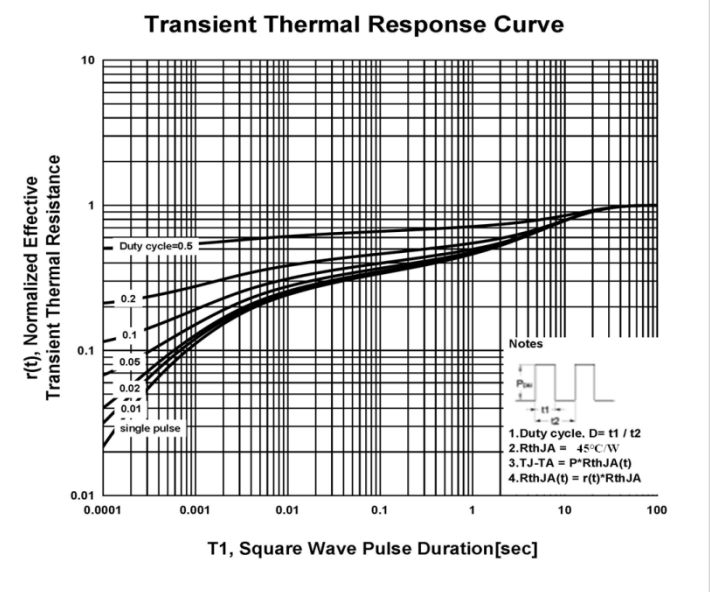

Capacitance Characteristic
C , Capacitance(pF)
V_{SS}, Source to Source Voltage(V)
CISS
COSS
CRSS
0
500
1000
1500
2000
2500
3000
3500
4000
4500
0
3
6
9
12
15

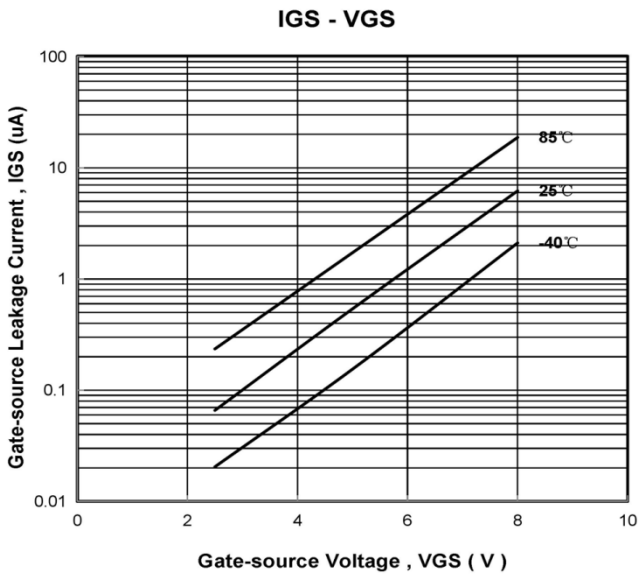

RSS(ON) -- Ta
RSS(ON), Source to Source ON Resistance(mohm)
VGS=2.5V, ID=3A
VGS=3.1V, ID=3A
VGS=3.8V, ID=3A
VGS=4.5V, ID=1A
TJ , Junction Temperature(°C)


Gate charge Characteristics
VSS=6V
IS=3A
VGS , Gate to Source Voltage(V)
Qg , Total Gate Charge(nC)

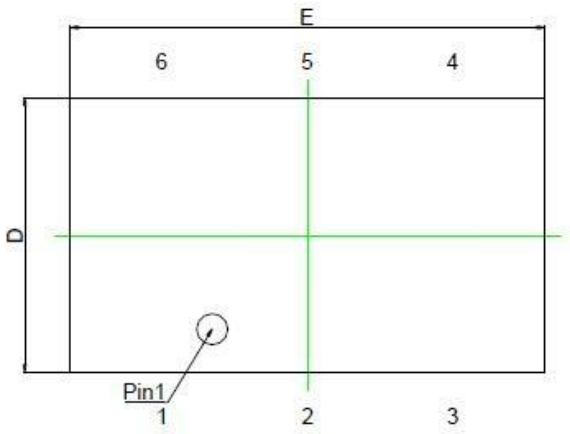

IS -- VF
150℃
25℃
IS , Source Current(A)
VSS , Source to Source Voltage(V)


Safe Operating Area
Operation in This Area is Limited by RDS(ON)
NOTE :
1.VGS = 10V
2.TA =25°C
3.RθJA = 45°C/W
4.Single Pulse
1ms
10ms
100ms
DC
IS , Source Current(A)
VSS , Source to Source Voltage(V)

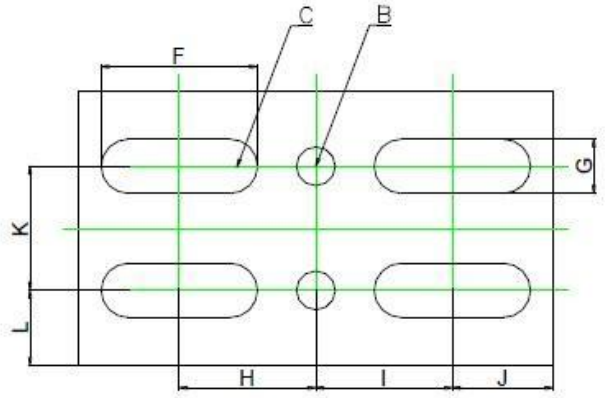

Transient Thermal Response Curve
r(t), Normalized Effective Transient Thermal Resistance
10
1
0.1
0.01
Duty cycle=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
Notes
1.Duty cycle, D= t1 / t2
2.RthJA = 45℃/W
3.TJ-TA = P*RthJA(t)
4.RthJA(t) = r(t)*RthJA
0.0001
0.001
0.01
0.1
1
10
100
T1, Square Wave Pulse Duration[sec]


IGS - VGS
Gate-source Leakage Current , IGS (uA)
100
10
1
0.1
0.01
85℃
25℃
-40℃
0
2
4
6
8
10
Gate-source Voltage , VGS (V)

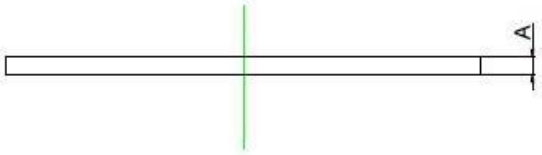
Package Dimensions, WLCSP 1.77x3.05



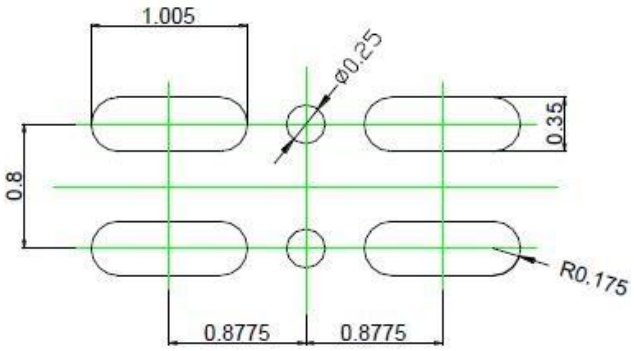
TOP View



Bottom View



Side View



Land Pattern

Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	0.125	0.130	0.135	G		0.35	
B		ø0.25		H		0.8775	
C		R0.175		I		0.8775	
D	1.73	1.77	1.81	J		0.6475	
E	3.01	3.05	3.09	K		0.80	
F		1.005		L		0.485	

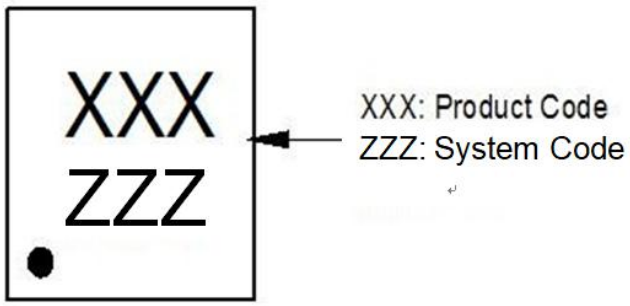
Note

1.Min.: Minimum dimension specified.

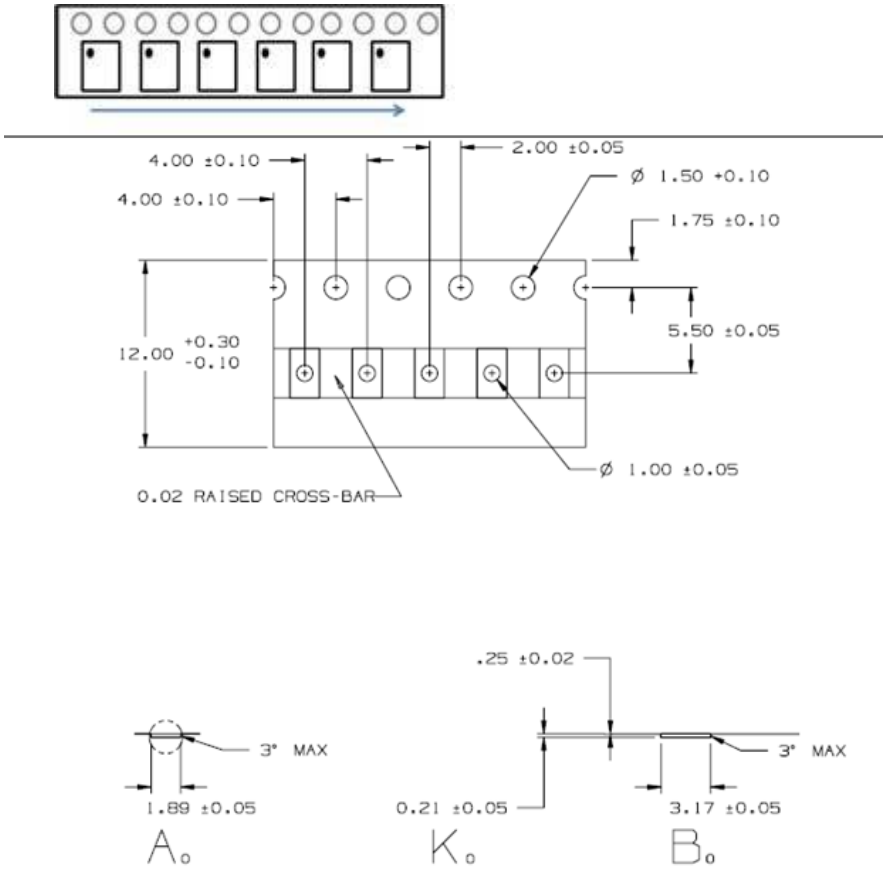
2.Max.: Maximum dimension specified.

3.Typ.: Type. Typical dimension specified for reference.

A. Marking Information(Product Code： A29)



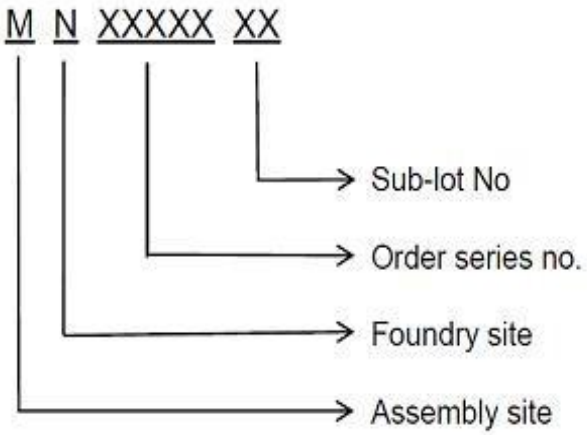
B. Tape&Reel Information:3000pcs/Reel



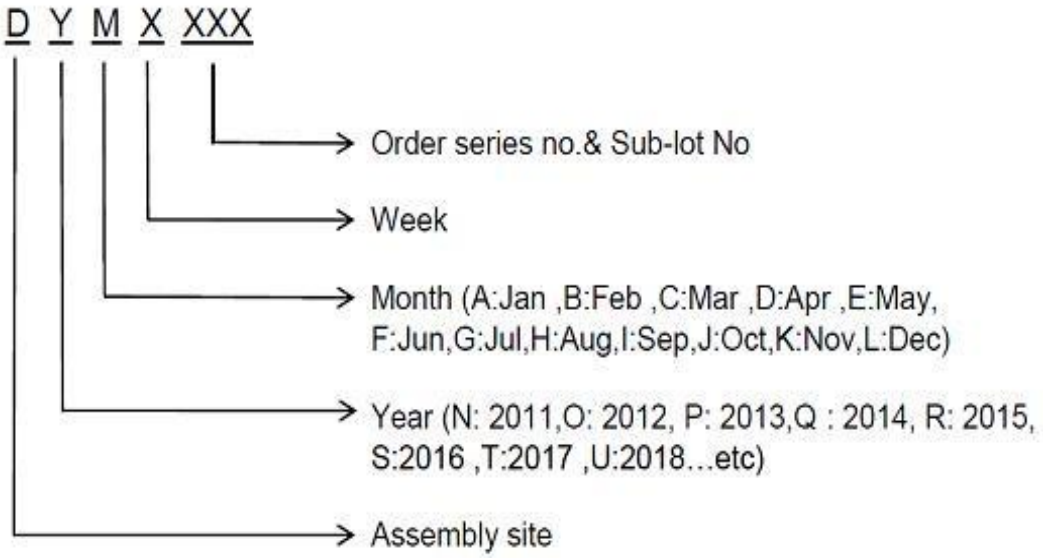
Note： All Dimension in millimeter

C. Lot No. & Date Code Rule

1.Lot No.



2.Date Code



D.Label rule

Label content

1	Label Size	30 * 90 mm
2	Font style	Times New Roman or Arial （或可区分英文”0”和数字”0”，”G和”Q”的字型即可）
3	U-NIKC	Height: 4 mm
4	Package	Height: 2 mm
5	Device	Height: 3 mm (Max: 16 Digit)
6	Lot	Height: 3 mm (Max: 9 Digit) Sub lot
7	D/C	Height: 3 mm (Max: 7 Digit)
8	QTY	Height: 3 mm (Max: 6 Digit) Thousand mark is no needed
9	RoHS label	RoHS long axis: 12 mm minor axis:6 mm bottom color: White Font color: Black Font style: Arial
10	Halogen Free label	G Diameter: 10 mm bottom color: Green Font color: Black Font style: Arial
11	Scan information	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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