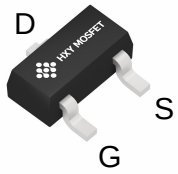
Description

The 5N10-HXY uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



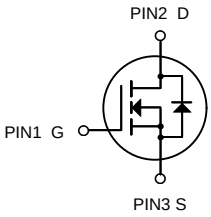
SOT-23-3L

General Features

V_{DS} = 100V I_D = 5A

$R_{DS(ON)}$ < 120mΩ @ V_{GS}=10V

$R_{DS(ON)}$ < 143mΩ @ V_{GS}=4.5V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
5N10-HXY	SOT-23-3L	1005	3000

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter	Limit	Unit
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
I_D	Drain Current-Continuous	5	A
IDM	Drain Current-Pulsed (Note 1)	20	A
P_D	Maximum Power Dissipation	1.5	W
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 175	℃
RθJA	Thermal Resistance,Junction-to-Ambient (Note 2)	100	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.0	1.5	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A	-	100	120	mΩ
		V_{GS}=4.5V, I_D=3A	-	130	143	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=3A	-	5	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	650	-	PF
Output Capacitance	C_{oss}		-	24	-	PF
Reverse Transfer Capacitance	C_{rss}		-	20	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V, R_L=19Ω V_{GS}=10V,R_G=3Ω	-	6	-	nS
Turn-on Rise Time	t_r		-	4	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	20	-	nS
Turn-Off Fall Time	t_f		-	4	-	nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=3A, V_{GS}=10V	-	20		nC
Gate-Source Charge	Q_{gs}		-	2.1	-	nC
Gate-Drain Charge	Q_{gd}		-	3.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=3A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

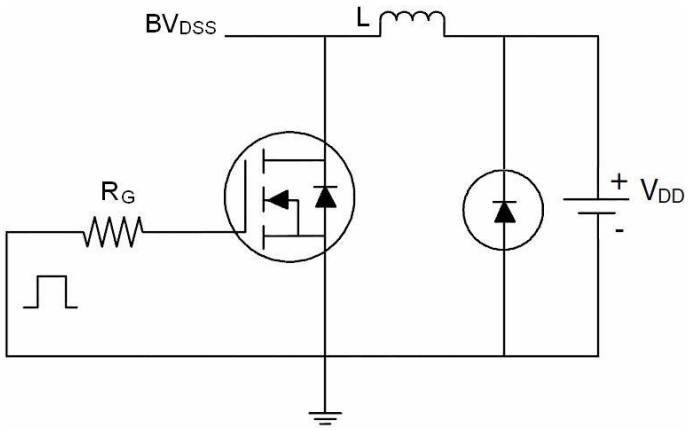
2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

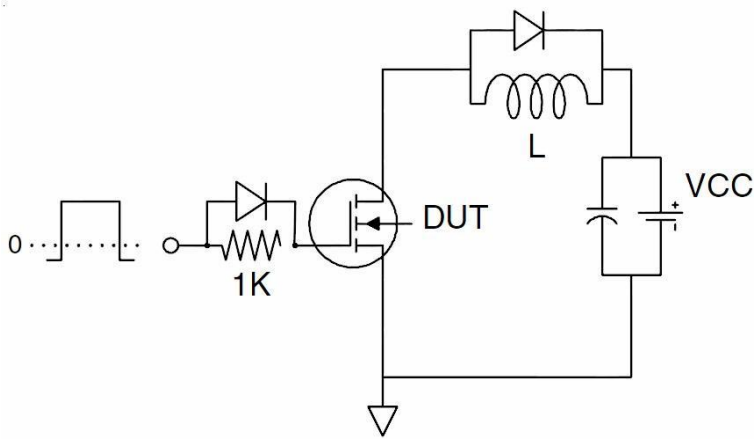
4. Guaranteed by design, not subject to production

Test Circuit

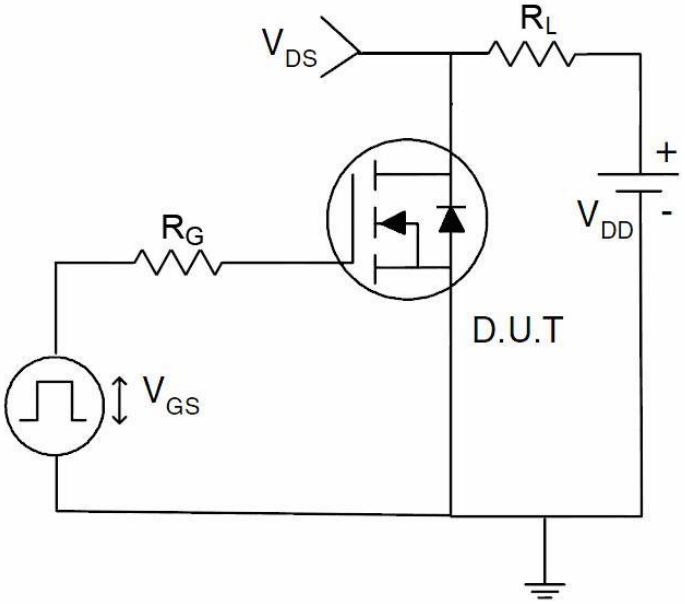
1）E_{AS} test circuit



2）Gate charge test circuit



3）Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

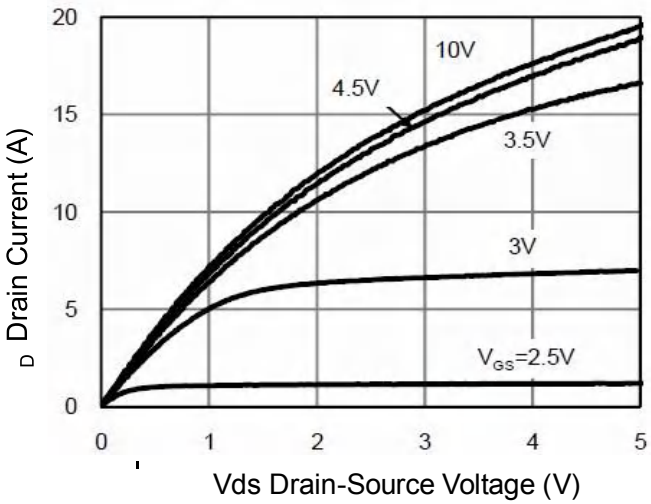


Figure 1 Output Characteristics

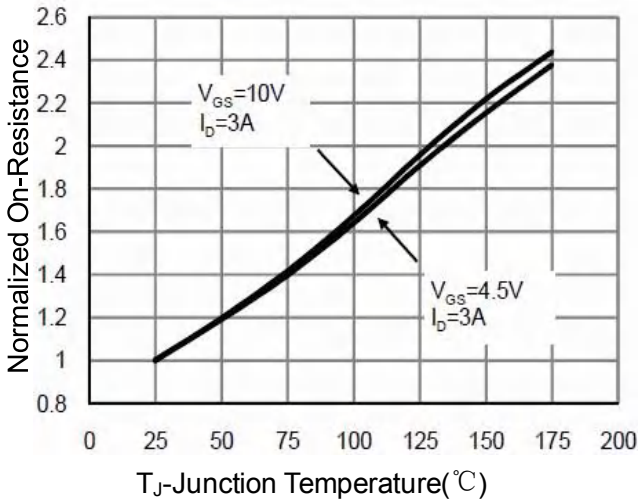
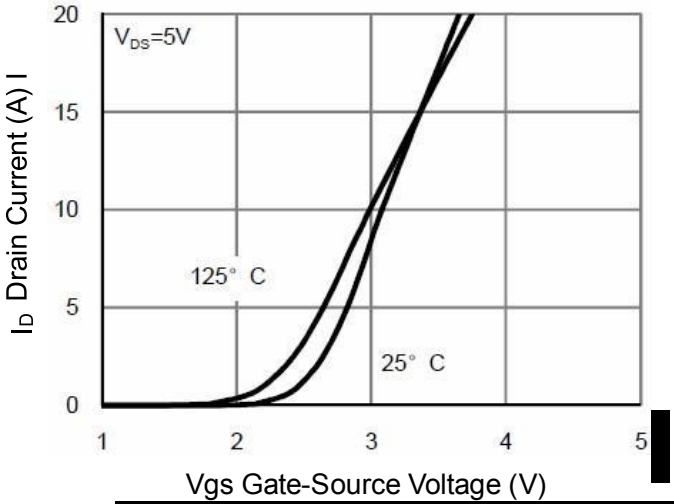
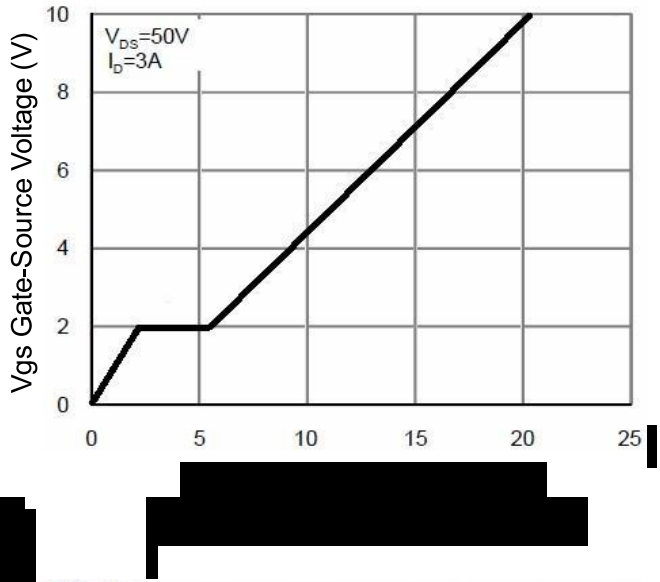
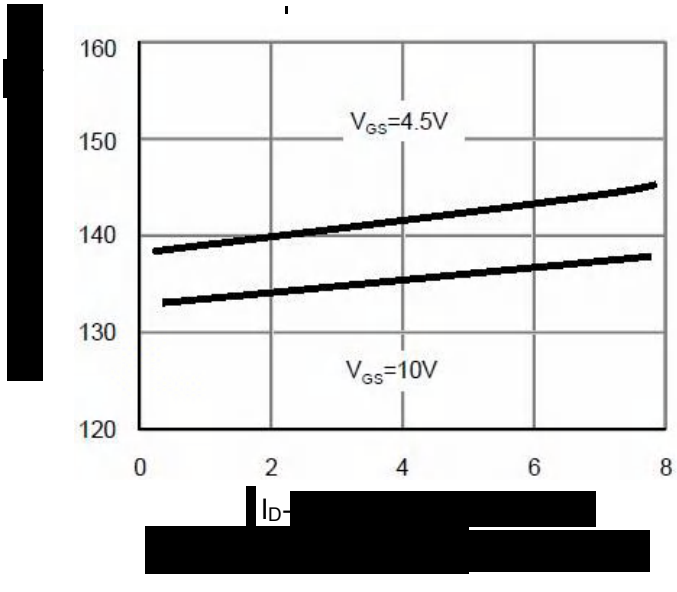
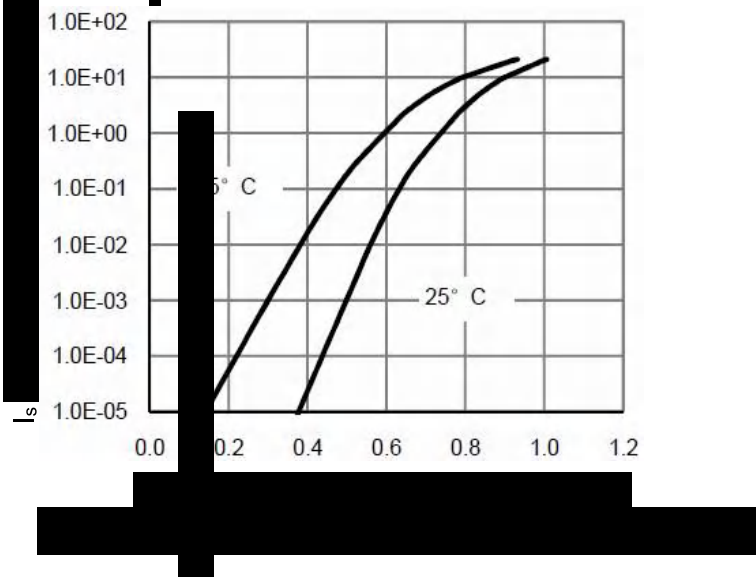


Figure 4 Rdson-JunctionTemperature









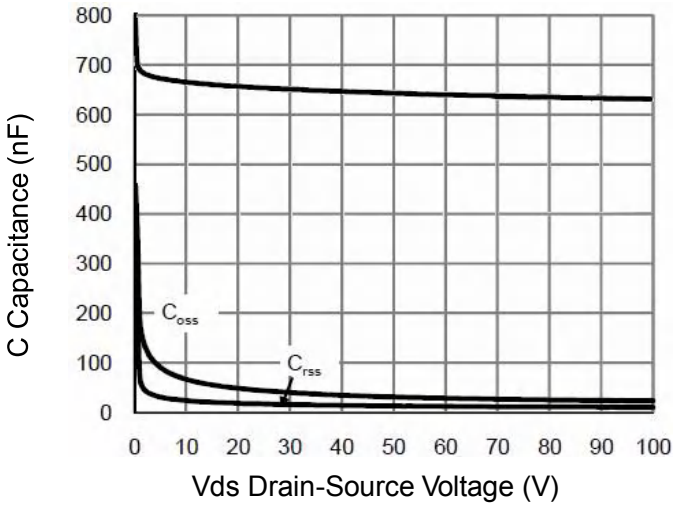


Figure 7 Capacitance vs Vds

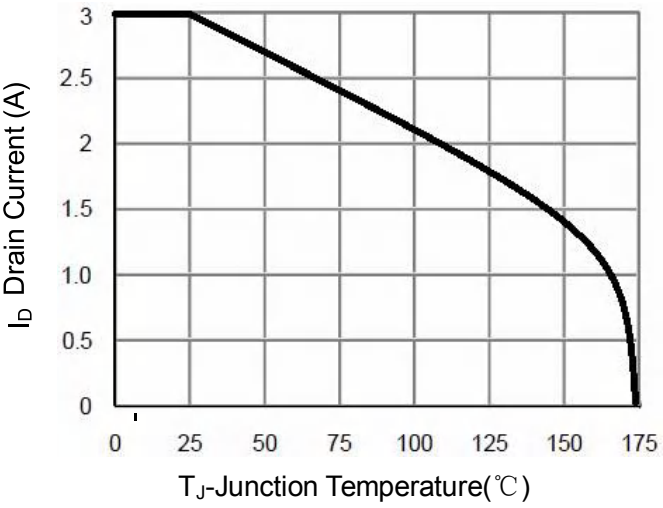


Figure 9 BV_{DSS} vs Junction Temperature

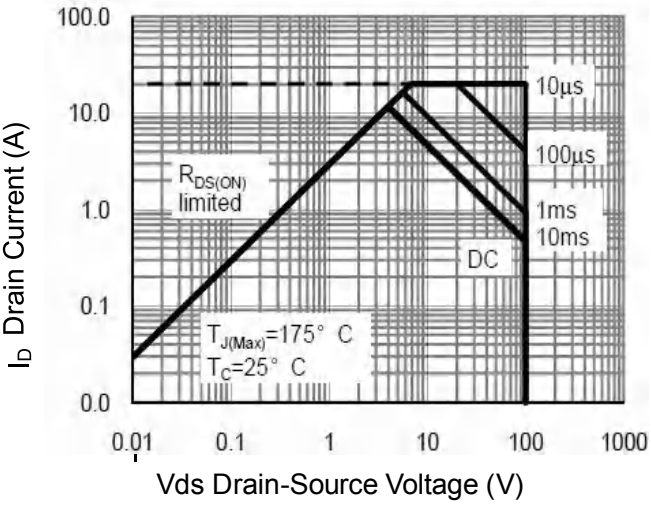


Figure 8 Safe Operation Area

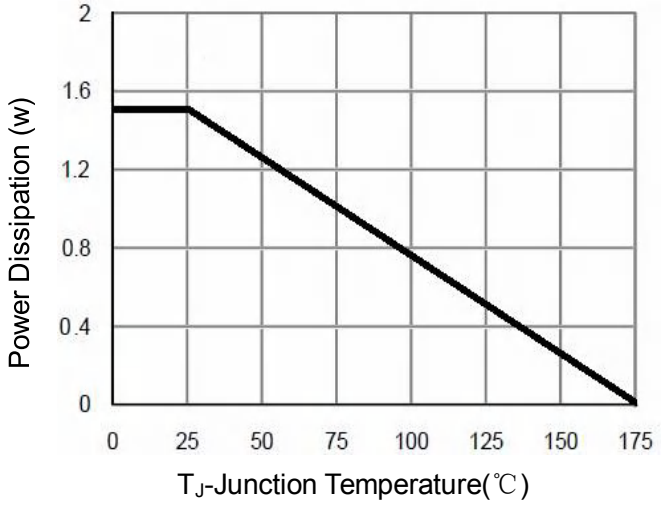


Figure 10 Power De-rating

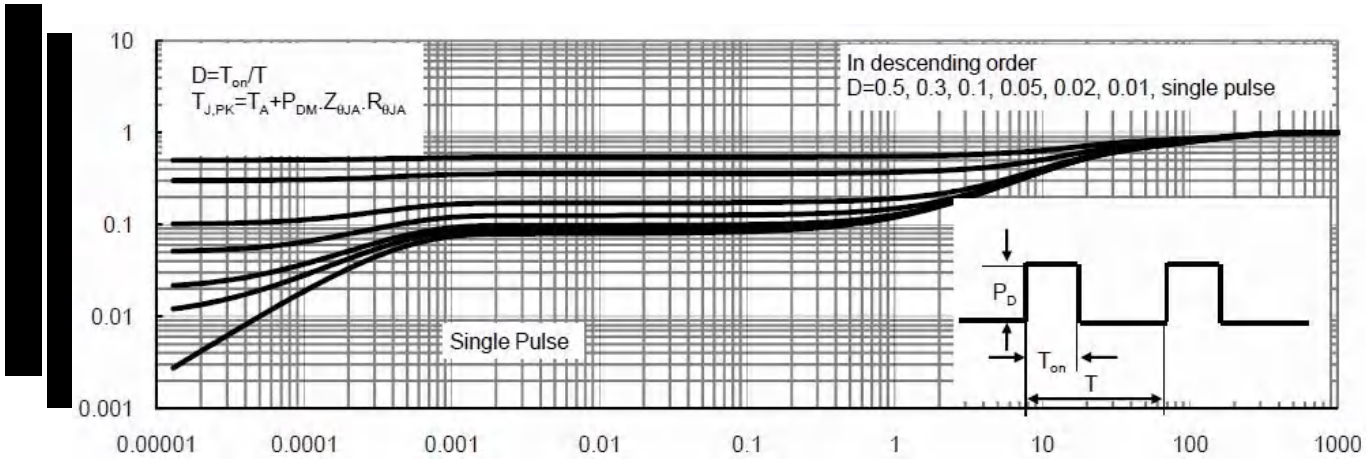
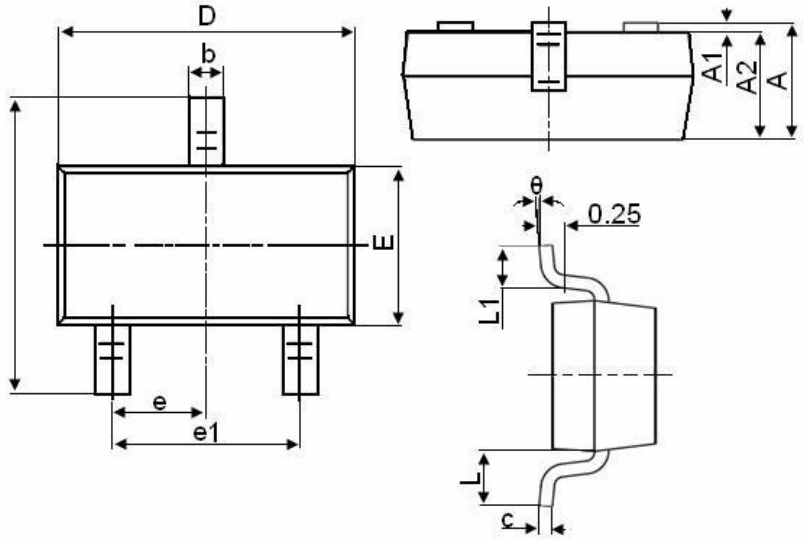


Figure 11 Normalized Maximum Transient Thermal Impedance

SOT-23-3L Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.800	3.000
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.600
θ	0°	8°

Attention

■ Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.

■ HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.

■ Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could
give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.