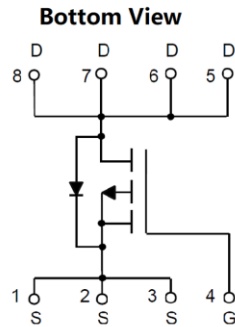
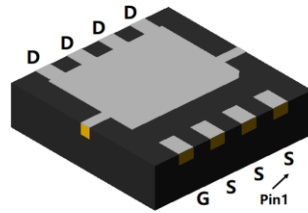
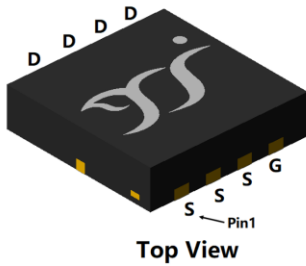


## P-Channel Enhancement Mode Field Effect Transistor



**DFN3333-8L**

### Product Summary

$V_{DS}$	-30 V
$I_D$	-25 A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	17 m
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	24 m
100% EAS Tested	

### General Description

Trench Power LV MOSFET technology  
High density cell design for Low  $R_{DS(ON)}$   
High Speed switching

Epoxy Meets UL 94 V-0 Flammability Rating  
Halogen Free

### Applications

Battery protection  
Load switch  
Power management

### Absolute Maximum Ratings ( $T_A=25$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	-30	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current	$T_A=25^\circ C$	$I_D$	-8	A
	$T_A=100^\circ C$		-5	
	$T_C=25^\circ C$		-25	
	$T_C=100^\circ C$		-15	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	-100	A
Avalanche energy <sup>B</sup>		EAS	60	mJ
Total Power Dissipation <sup>C</sup>	$T_A=25^\circ C$	$P_D$	2	W
	$T_A=100^\circ C$		0.8	
	$T_C=25^\circ C$		34	
	$T_C=100^\circ C$		13	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 +150	$^\circ C$

### Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>D</sup>	Steady-State	R	50	60	$^\circ C/W$
Thermal Resistance Junction-to-Case	Steady-State	R	3	3.6	

### Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ25P03AJ	F1	Q25P03AJ	5000	10000	100000	1 reel



# YJQ25P03AJ

## Electrical Characteristics ( $T_J=25$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-$	-30	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	
		$V_{DS}=-30V, V_{GS}=0V, T_J=150^\circ C$	-	-	-100	
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-$	-1	-1.5	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$	-	13	17	
		$V_{GS}=-4.5V, I_D=-20A$	-	18	24	
Diode Forward Voltage	$V_{SD}$	$I_S=-20A, V_{GS}=0V$	-	-	-1.2	V
Gate resistance	$R_G$	$f=1MHz$	-	5	-	
Maximum Body-Diode Continuous Current	$I_S$		-	-	-25	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	-	1380	-	pF
Output Capacitance	$C_{oss}$		-	170	-	
Reverse Transfer Capacitance	$C_{rss}$		-	155	-	
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=-10V, V_{DS}=-15V, I_D=-20A$	-	30	-	nC
Gate-Source Charge	$Q_{gs}$		-	3	-	
Gate-Drain Charge	$Q_{gd}$		-	5.5	-	
Reverse Recovery Charge	$Q_{rr}$	$I_F=-20A, di/dt=100A/us$	-	8	-	nC
Reverse Recovery Time	$t_{rr}$		-	21	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DD}=-15V, I_D=-20A$ $R_{GEN}=2.5$	-	13	-	ns
Turn-on Rise Time	$t_r$		-	7	-	
Turn-off Delay Time	$t_{D(off)}$		-	73	-	
Turn-off fall Time	$t_f$		-	16	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B.  $T_J=25^\circ C, V_{DD}=-25V, V_G=-10V, R_G=1mH, I_{AS}=-11A$ .

C.  $P_d$  is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

D. The value of  $R_{\theta JC}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper



## Typical Electrical and Thermal Characteristics Diagrams

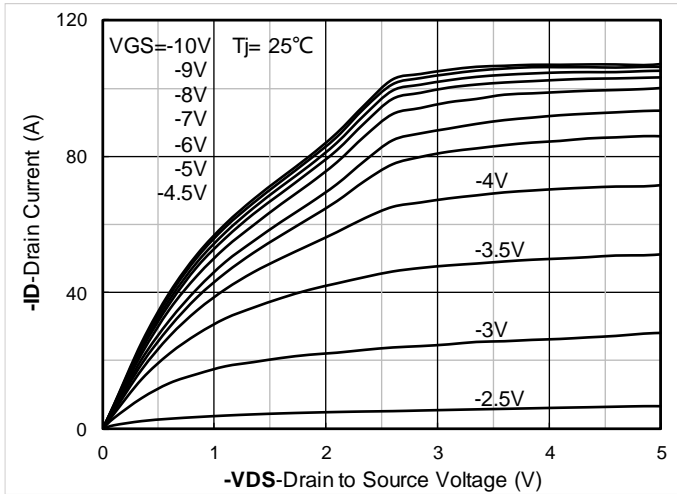


Figure 1. Output Characteristics

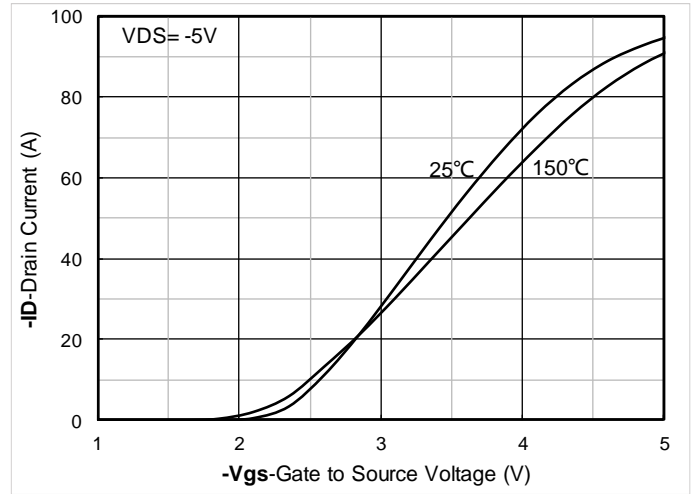


Figure 2. Transfer Characteristics

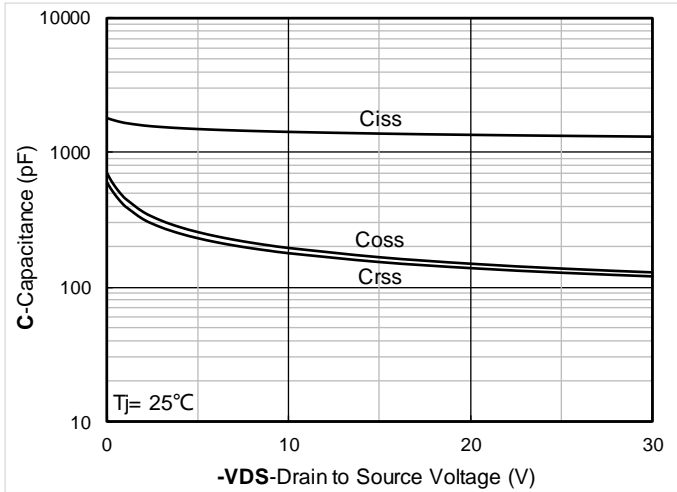


Figure 3. Capacitance Characteristics

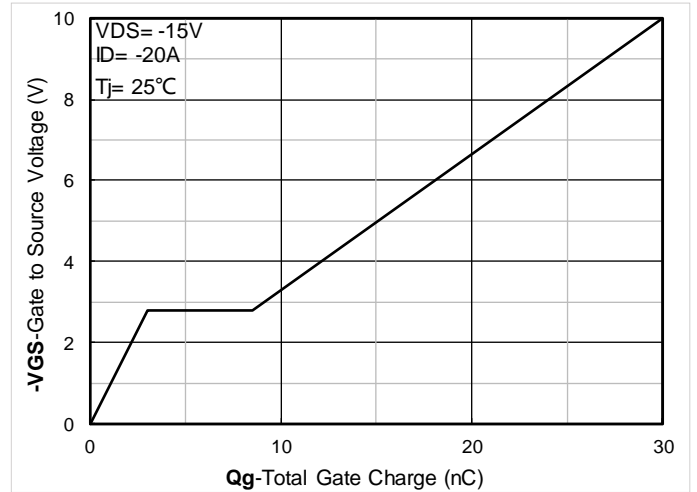


Figure 4. Gate Charge

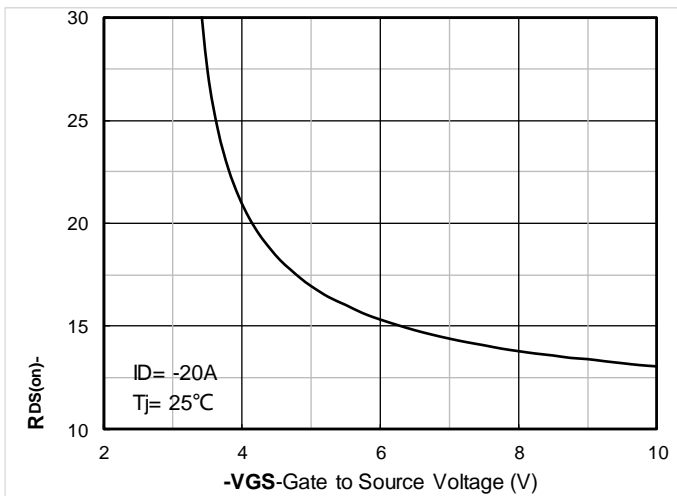


Figure 5. On-Resistance vs Gate to Source Voltage

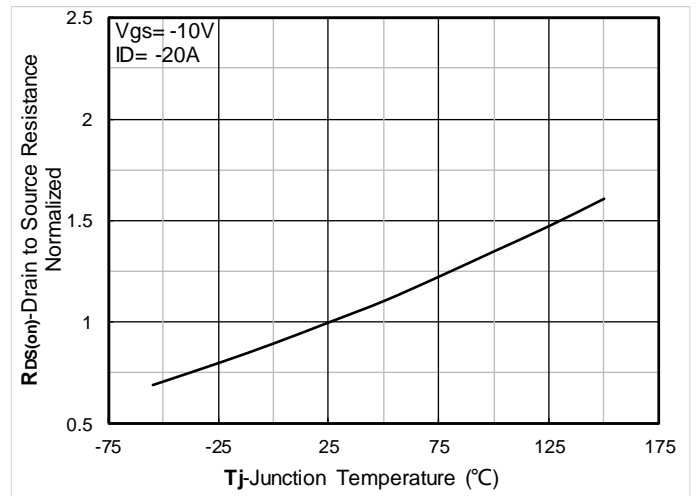


Figure 6. Normalized On-Resistance



# YJQ25P03AJ

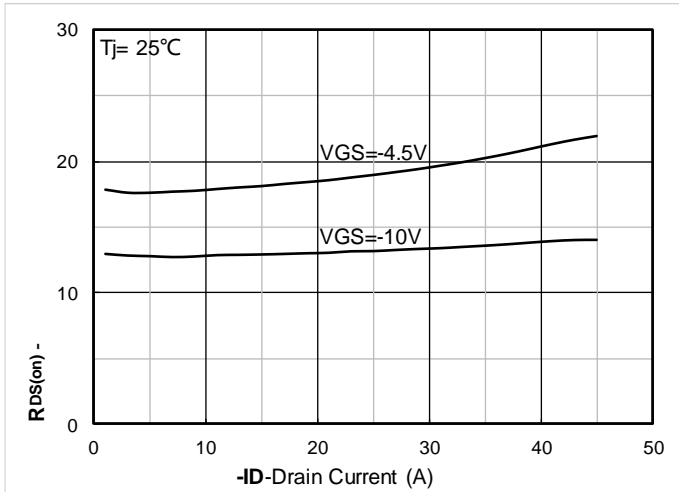


Figure 7. RDS(on) VS Drain Current

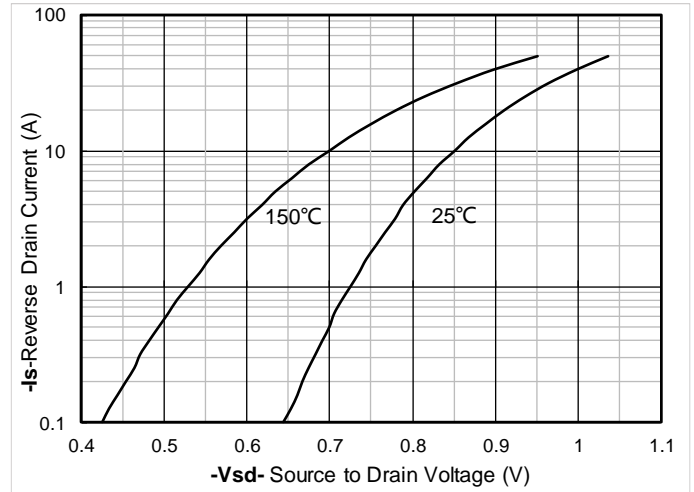


Figure 8. Forward characteristics of reverse diode

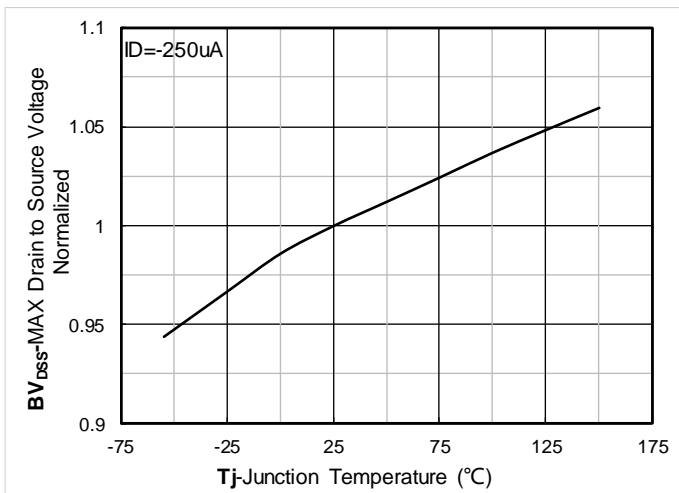


Figure 9. Normalized breakdown voltage

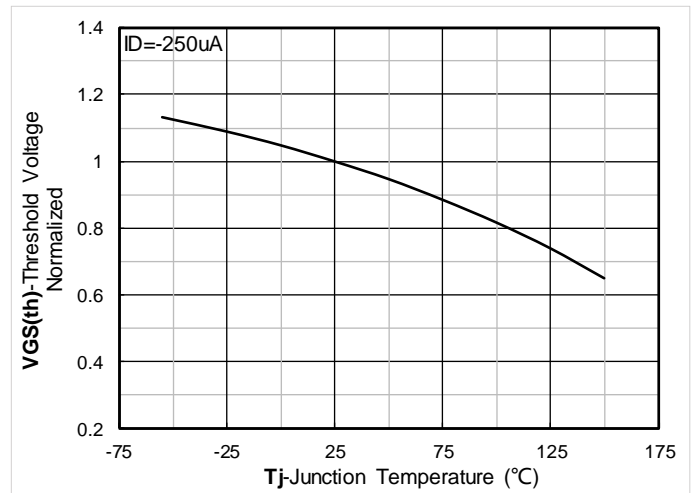


Figure 10. Normalized Threshold voltage

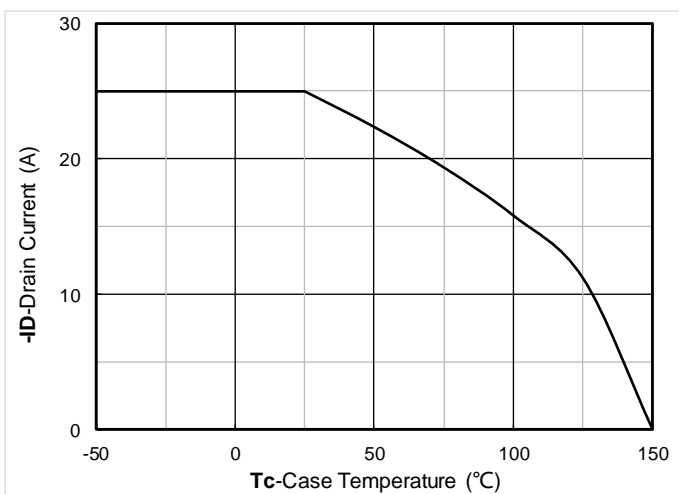


Figure 11. Current dissipation

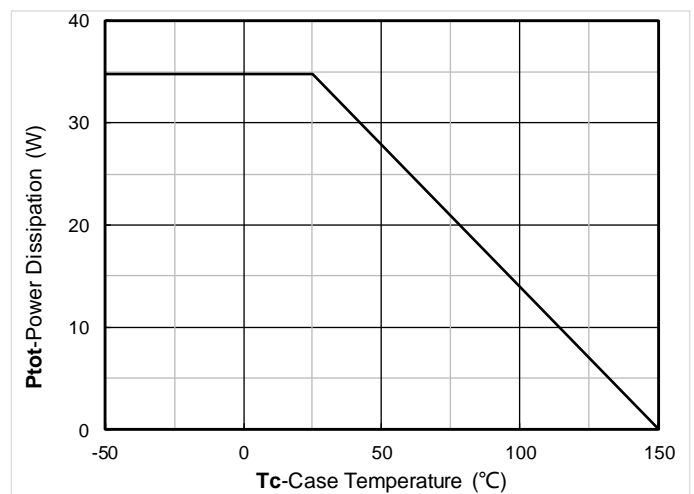


Figure 12. Power dissipation



# YJQ25P03AJ

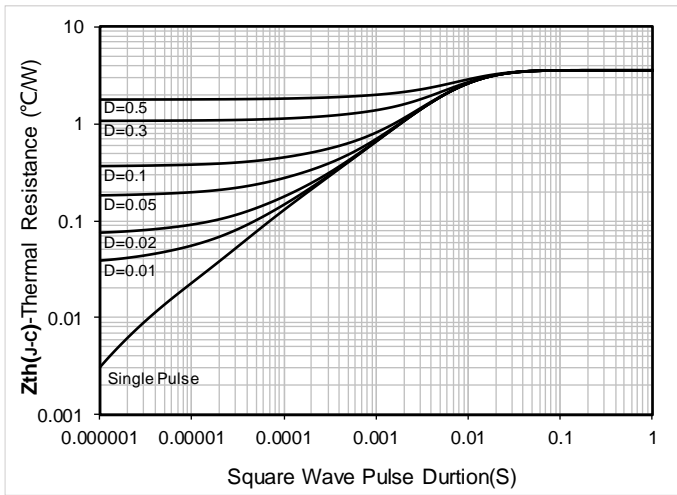


Figure 13. Maximum Transient Thermal Impedance

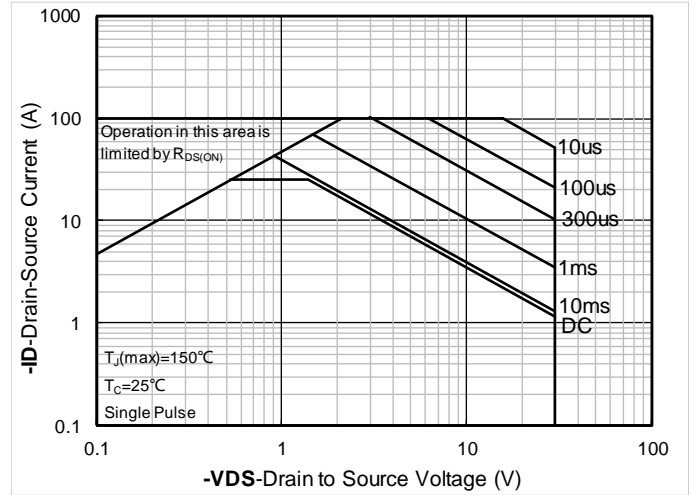
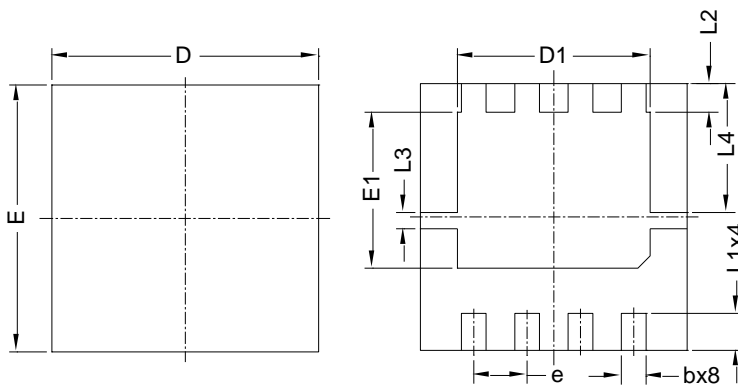


Figure 14. Safe Operation Area



# YJQ25P03AJ

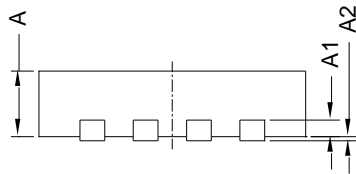
## DFN3333-8L-A Package information



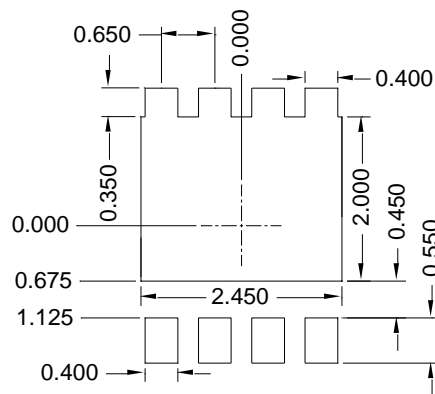
Top View

Bottom View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	3.15	3.25	3.35
E	3.15	3.25	3.35
A	0.70	0.80	0.90
A1	0.20 BSC		
A2			0.10
D1	2.20	2.35	2.50
E1	1.80	1.90	2.00
L1	0.35	0.45	0.55
L2	0.35 BSC		
L3	0.20 BSC		
L4	1.57 BSC		
b	0.20	0.30	0.40
e	0.65 BSC		



Side View



Suggested Solder Pad Layout  
Top View

Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.10$ mm.
3. The pad layout is for reference purposes only.



## YJQ25P03AJ

---

### Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <http://www.21yangjie.com> for assistance.