

## N-Channel Enhancement Mode Field Effect Transistor

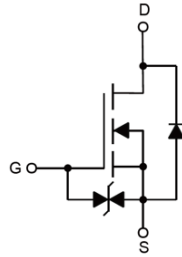


Top View



Bottom View

DFN1006-3L



### Product Summary

- $V_{DS}$  20 V
- $I_D$  0.7 A
- $R_{DS(ON)}$  (at  $V_{GS}=4.5V$ ) < 300 mohm
- $R_{DS(ON)}$  (at  $V_{GS}=2.5V$ ) < 350 mohm
- $R_{DS(ON)}$  (at  $V_{GS}=1.8V$ ) < 700 mohm
- ESD Protected Up to 2.0KV (HBM)

### General Description

- Trench Power LV MOSFET technology
- High Power and current handling capability
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- PWM application
- Load switch

### ■ Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	20	V
Gate-source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current	$I_D$	$T_A=25^\circ C$	0.7
		$T_A=100^\circ C$	0.44
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	3	A
Total Power Dissipation <sup>B</sup>	$P_D$	$T_A=25^\circ C$	0.9
		$T_A=100^\circ C$	0.36
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>C</sup>	$R_{\theta JA}$	110	138	$^\circ C/W$

### ■ Ordering Information

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJA3134KB	F1	4A	10000	100000	400000	7" reel



# YJA3134KB

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C			100	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> =0V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	0.35	0.75	1.1	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> =0.7A		180	300	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =0.5A		260	350	
		V <sub>GS</sub> = 1.8V, I <sub>D</sub> =0.2A		490	700	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =0.7A, V <sub>GS</sub> =0V			1.2	V
Gate Resistance	R <sub>g</sub>	f=1 MHz		50		Ω
Maximum Body-Diode Continuous Current	I <sub>S</sub>				0.7	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ		56		pF
Output Capacitance	C <sub>oss</sub>			20		
Reverse Transfer Capacitance	C <sub>rss</sub>			2.5		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =0.7A		1		nC
Gate Source Charge	Q <sub>gs</sub>			0.28		
Gate Drain Charge	Q <sub>gd</sub>			0.22		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =0.7A, di/dt=20A/us		0.4		
Reverse Recovery Time	t <sub>rr</sub>			14.4		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DD</sub> =10V, R <sub>G</sub> =10Ω, I <sub>D</sub> =700mA		2		ns
Turn-on Rise Time	t <sub>r</sub>			18.8		
Turn-off Delay Time	t <sub>D(off)</sub>			10		
Turn-off Fall Time	t <sub>f</sub>			23		

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

B. P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.

C. The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub> =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



## ■ Typical Performance Characteristics

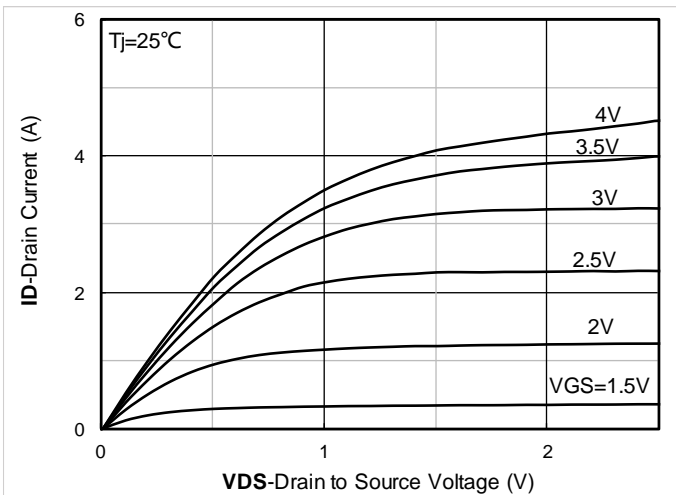


Figure 1. Output Characteristics

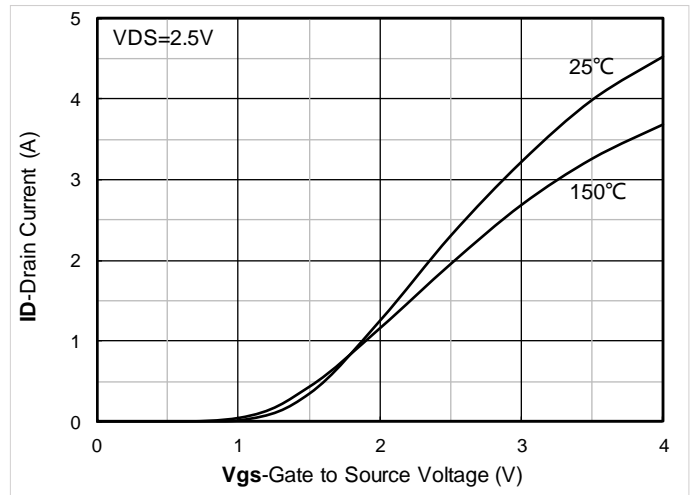


Figure 2. Transfer Characteristics

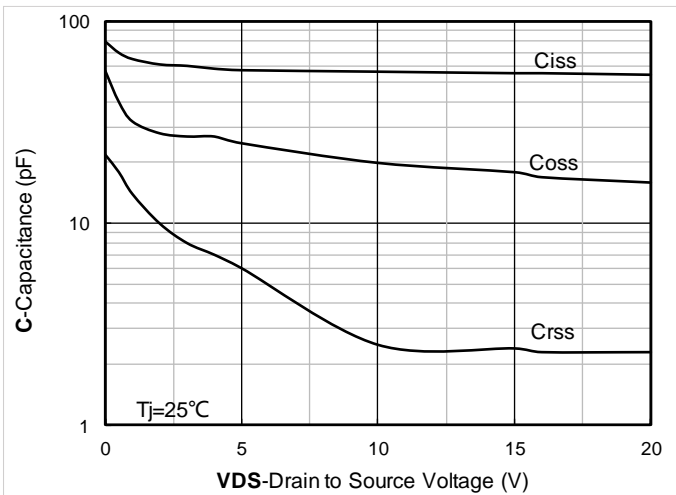


Figure 3. Capacitance Characteristics

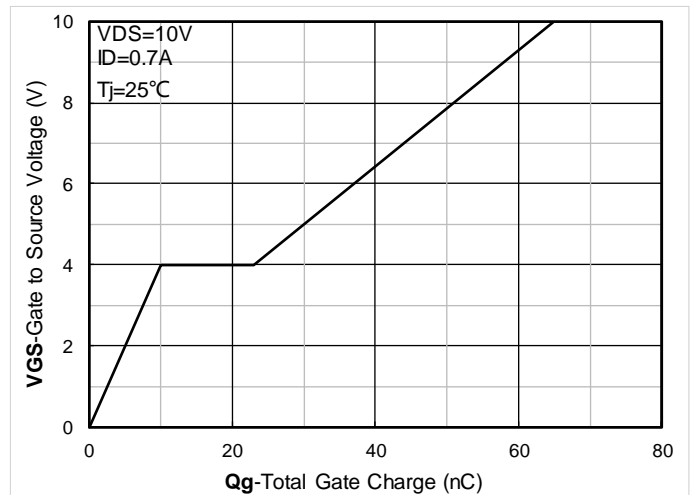


Figure 4. Gate Charge

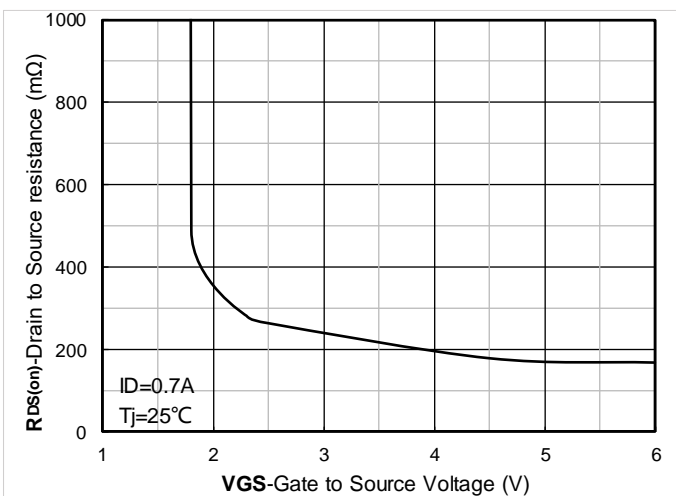


Figure 5. On-Resistance vs Gate to Source Voltage

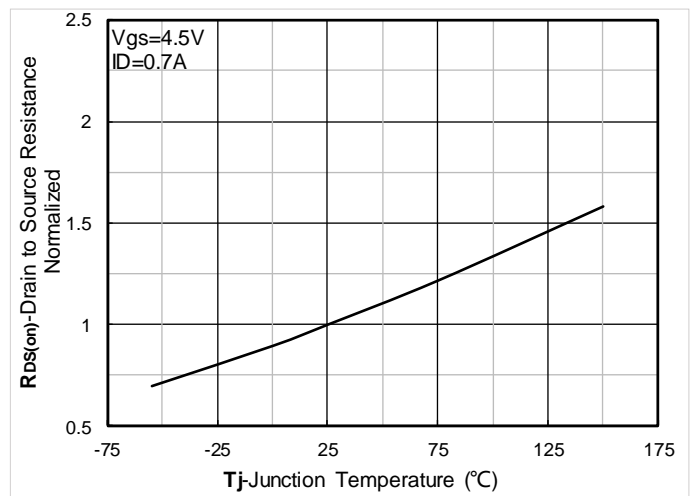


Figure 6. Normalized On-Resistance

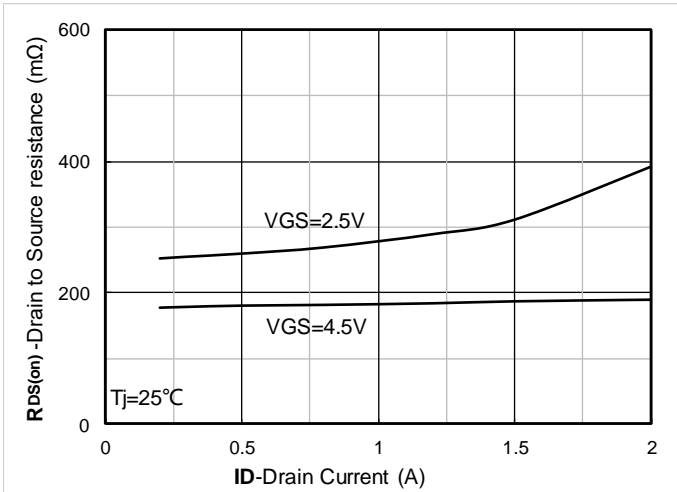


Figure 7. RDS(on) VS Drain Current

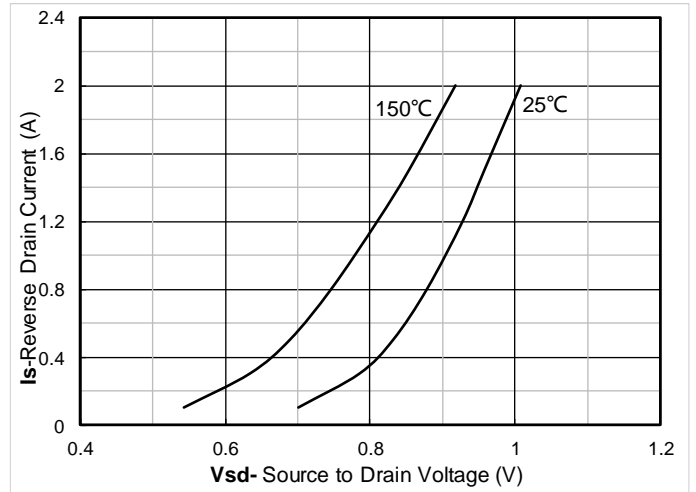


Figure 8. Forward characteristics of reverse diode

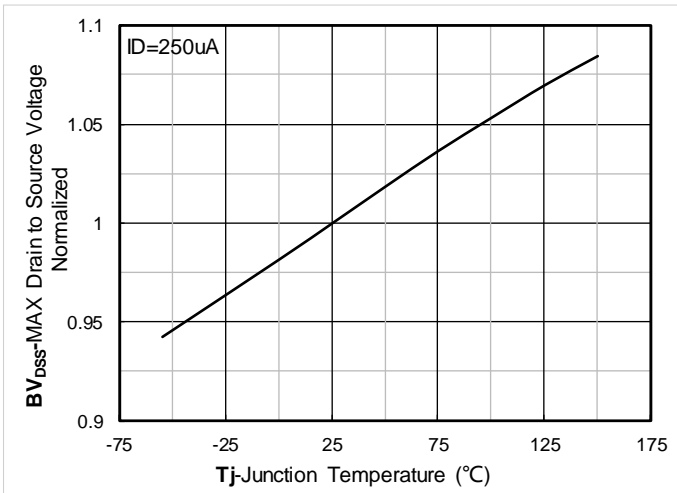


Figure 9. Normalized breakdown voltage

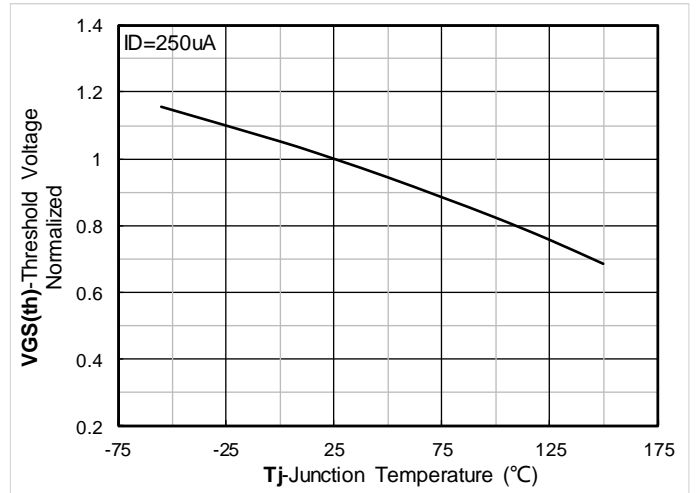


Figure 10. Normalized Threshold voltage

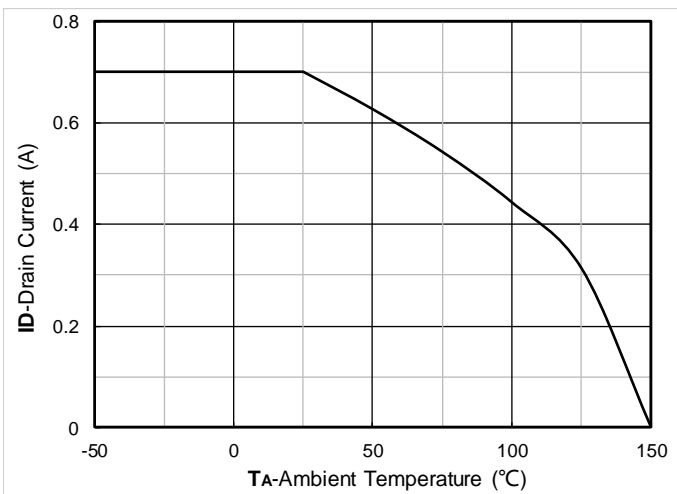


Figure 11. Current dissipation

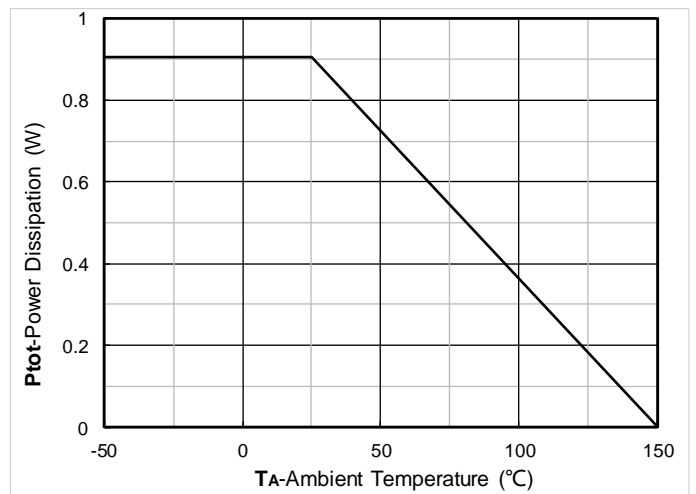


Figure 12. Power dissipation



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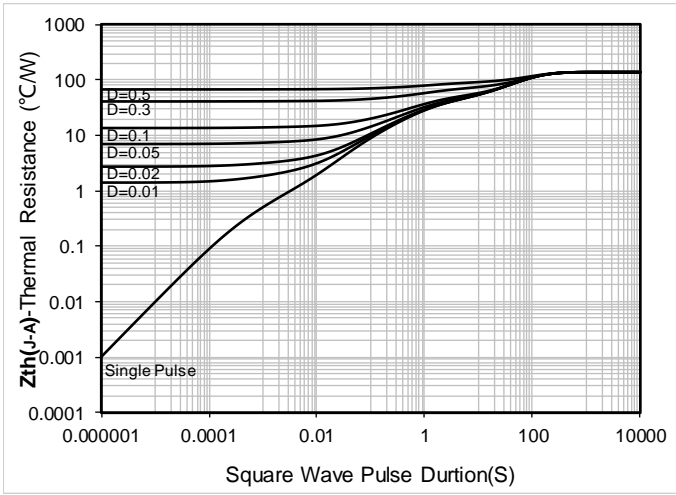


Figure 13. Maximum Transient Thermal Impedance

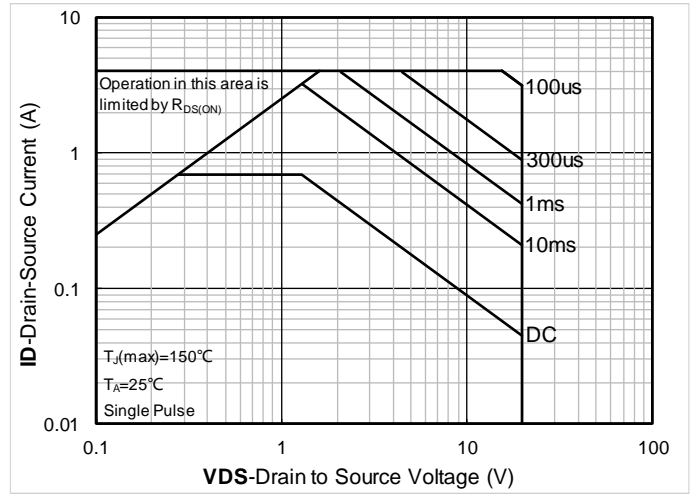
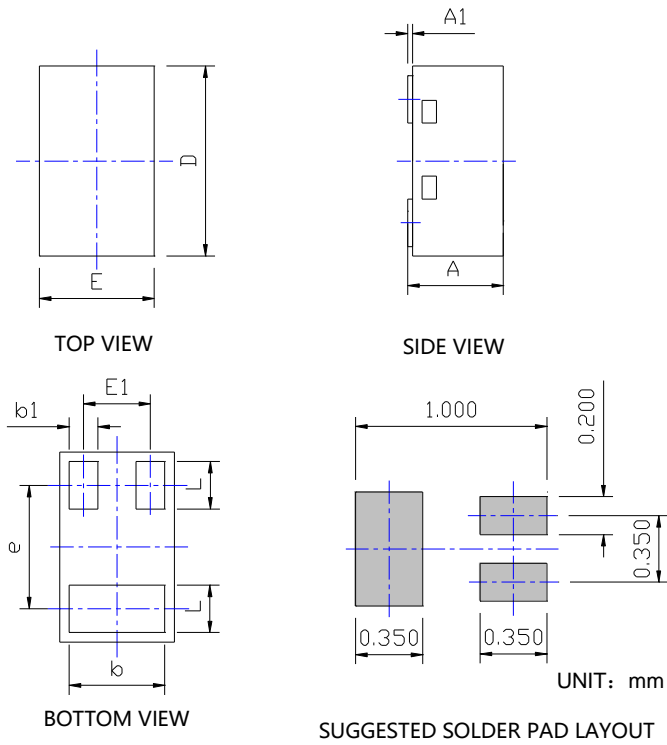


Figure 14. Safe Operation Area



# YJA3134KB

## DFN1006-3L Package information



DIMENSIONS			
SYMBOL	Millimeter		
	MIN.	NOM.	MAX.
A	0.42	---	0.55
A1	0.025REF		
b	0.45	0.50	0.55
b1	0.10	0.15	0.20
D	0.95	1.00	1.05
E	0.55	0.60	0.65
E1	0.35BSC		
e	0.65BSC		
L	0.20	0.25	0.30

**NOTE:**  
1. PACKAGE BODY SIZES EXCLUDE LEAD BURRS.  
2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.  
3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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