

SuperMOS – DFN1006-3L 20V BV_{DSS}, 180mΩ R_{DS(ON)}, N-channel MOSFET

1. Description

The ESJA3134KA is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R_{DS(ON)} with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product ESJA3134KA is Pb-free.

2. Features

- 20V, R_{DS(ON)}=180mΩ(Typ.) @V_{GS}=4.5V
R_{DS(ON)}=260mΩ(Typ.) @V_{GS}=2.5V
R_{DS(ON)}=415mΩ(Typ.) @V_{GS}=1.8V
- High density cell design for low R_{DS(on)}
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

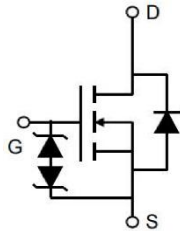
3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
ESJA3134KA	DFN1006-3L	34KE	Halogen free	Tape & Reel	10K PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_A = 25^\circ\text{C}$	I_D	0.7	A
	$T_A = 75^\circ\text{C}$		0.54	
Maximum Power Dissipation		P_D	0.22	W
Pulsed Drain Current		I_{DM}	2.8	A
Operating Junction Temperature		T_J	150	$^\circ\text{C}$
Lead Temperature		T_L	260	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance	$t \leq 10\text{s}$	$R_{\theta JA}$		556	$^\circ\text{C/W}$

Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	0.35	0.75	1.1	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =0.6A		180	300	mΩ
		V _{GS} =2.5V, I _D =0.5A		260	350	
		V _{GS} =1.8V, I _D =0.2A		415	700	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, f=1MHz, V _{DS} =10V		56		pF
Output Capacitance	C _{OSS}			20		
Reverse Transfer Capacitance	C _{RSS}			2.5		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =4.5V, V _{DS} =10V, I _D =0.5A		1		nC
Gate-to-Source Charge	Q _{GS}			0.28		
Gate-to-Drain Charge	Q _{GD}			0.22		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =4.5V, V _{DS} =10V, I _D =0.5A, R _G =3Ω		2		ns
Rise Time	t _r			18.8		
Turn-Off Delay Time	t _{d(OFF)}			10		
Fall Time	t _f			25		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =0.7A			1.5	V

7. Typical Characteristic

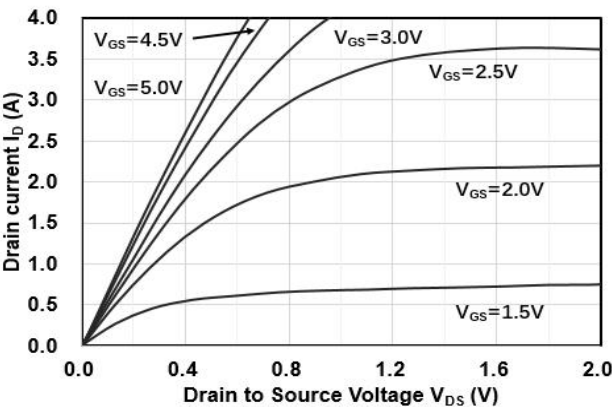


Figure1. Output Characteristics

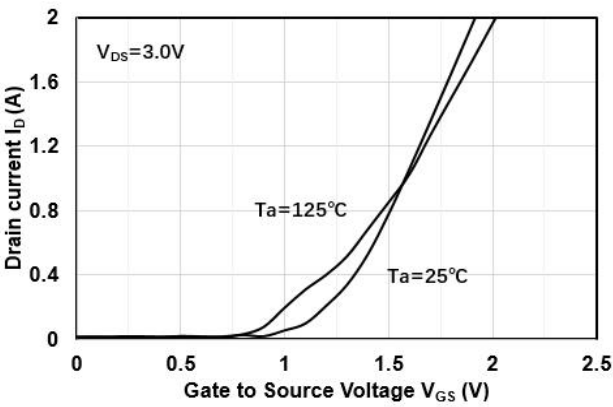


Figure2. Transfer Characteristics

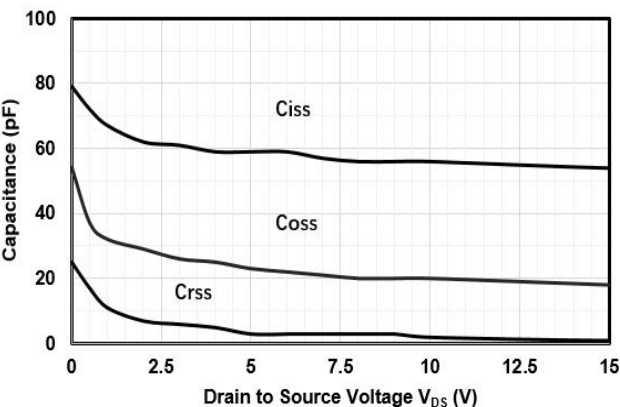


Figure3. Capacitance Characteristics

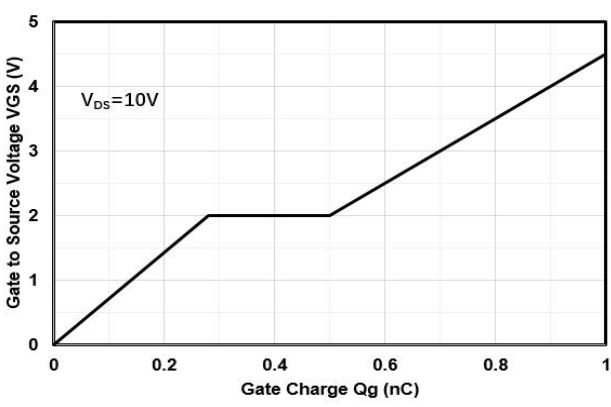


Figure4. Gate Charge

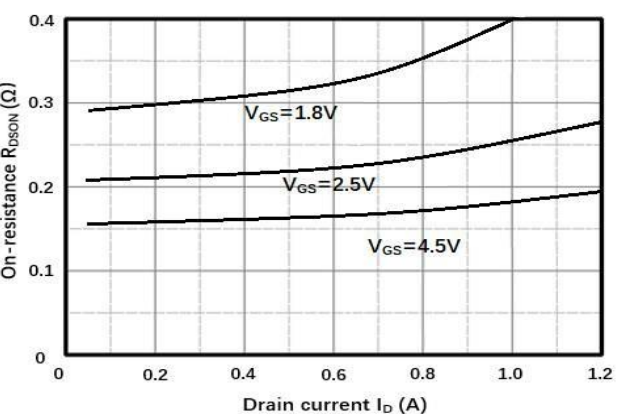


Figure5. Drain-Source on Resistance

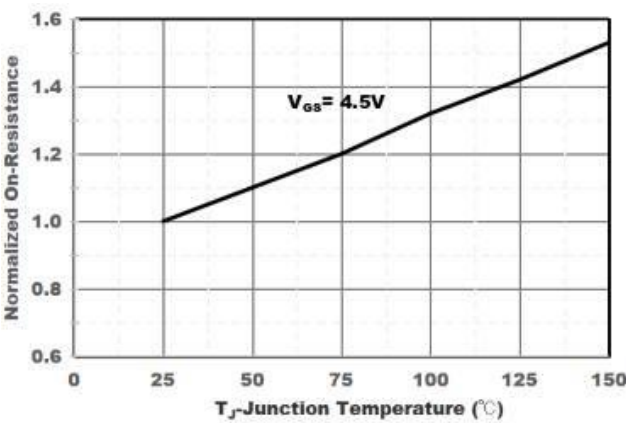


Figure6. Drain-Source on Resistance

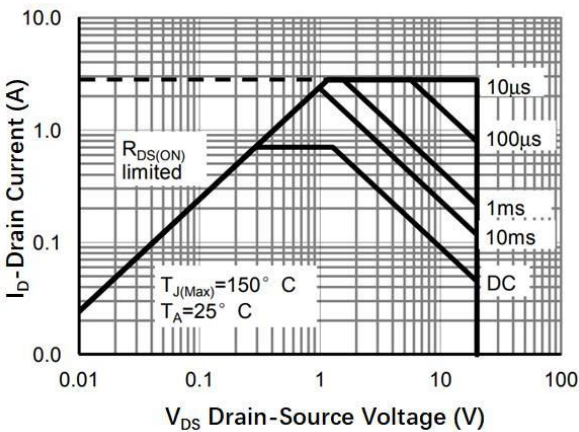


Figure7. Safe Operation Area

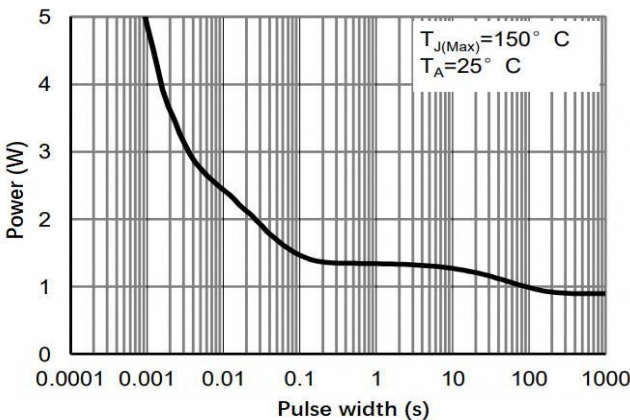


Figure8. Pulse Power Rating Junction-to Ambient

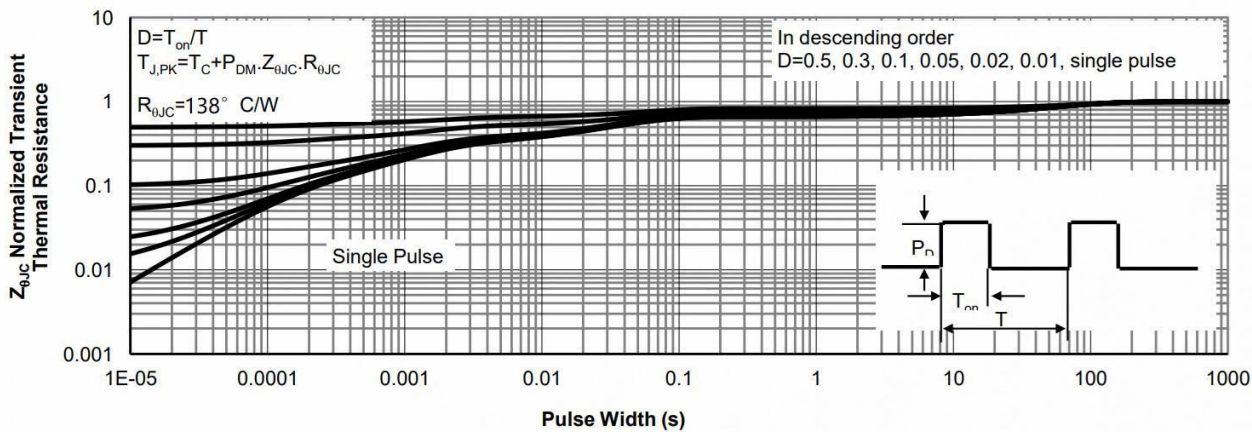
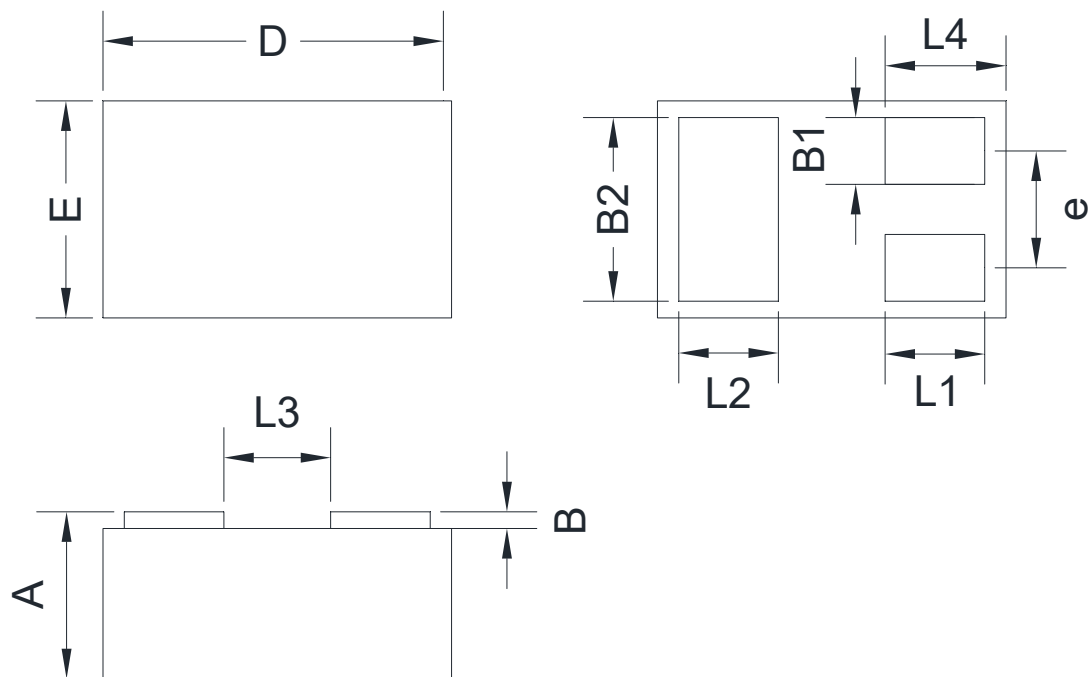


Figure9. Normalized Maximum Transient Thermal Impedance

ESJA3134KA

Rev-1.4

8. Dimension (DFN1006-3L)



Symbol	Millimeters		Symbol	Millimeters	
	Min	Max		Min	Max
A	0.40	0.50	e	0.35	
B	0.00	0.05	L1	0.20	0.30
B1	0.10	0.20	L2	0.20	0.30
B2	0.45	0.55	L3	0.39	
D	0.90	1.05	L4	0.25	0.35
E	0.50	0.65			

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