SuperMOS – SOT23-6L 20V BV_{DSS}, 220mΩ $R_{DS(ON)}$, N-channel MOSFET

1. Description

The ES3134KL 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 ES3134KL is Pb-free.

2. Features

- 20V, $R_{DS(ON)}$=220mΩ(Typ.) @ V_{GS}=4.5V
  $R_{DS(ON)}$=290mΩ(Typ.) @V_{GS}=2.5V
  $R_{DS(ON)}$=420mΩ(Typ.) @V_{GS}=1.8V
- Use trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

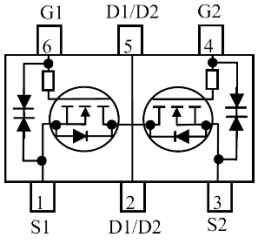
3. Applications

- 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
ES3134KL	SOT23-6L	.34KL	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
6	Gate1		
1	Source1		
2/5	Drain1/2		
4	Gate2		
3	Source2		

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°C	I_D	0.88	A
	T_A=75°C		0.68	
Maximum Power Dissipation		P_D	0.35	W
Pulsed Drain Current		I_{DM}	3.52	A
Operating Junction Temperature		T_J	150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance	t ≤ 10s	$R_{\theta JA}$		357	°C/W

Electrical Characteristics

At TA = 25℃ 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=0.5A		220	300	mΩ
		V_{GS}=2.5V, I_D=0.4A		290	400	
		V_{GS}=1.8V, I_D=0.2A		420	700	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=1MHz, V_{DS}=10V		33		pF
Output Capacitance	C_{OSS}			20		
Reverse Transfer Capacitance	C_{RSS}			10		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=4.5V, V_{DS}=10V, I_D=0.5A		0.8		nC
Gate-to-Source Charge	Q_{GS}			0.3		
Gate-to-Drain Charge	Q_{GD}			0.15		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=4.5V, V_{DS}=10V, I_D=0.5A, R_G=10Ω		4		ns
Rise Time	t_r			18.8		
Turn-Off Delay Time	$t_{d(OFF)}$			10		
Fall Time	t_f			23		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=0.5A			1.2	V

7. Typical Characteristic

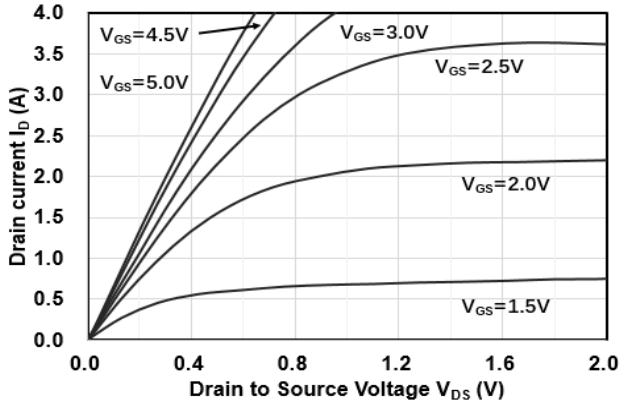


Figure1. Output Characteristics

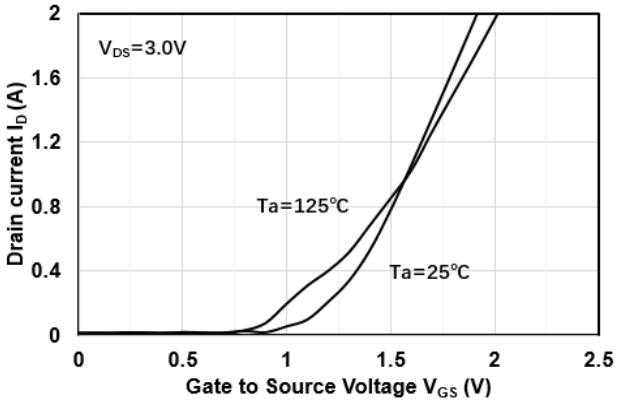


Figure2. Transfer Characteristics

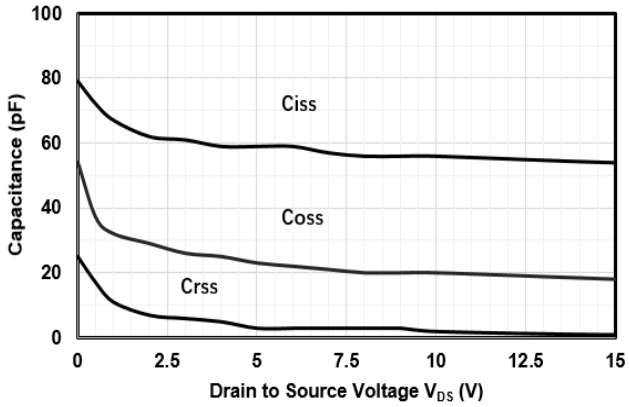


Figure3. Capacitance Characteristics

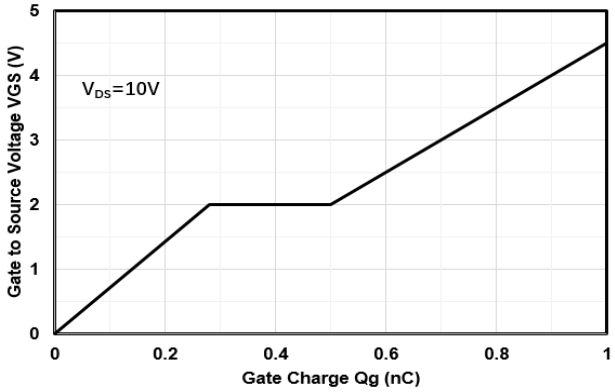


Figure4. Gate Charge

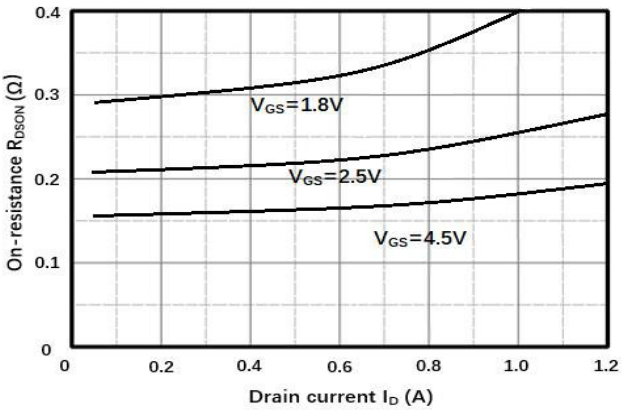


Figure5. Drain-Source on Resistance

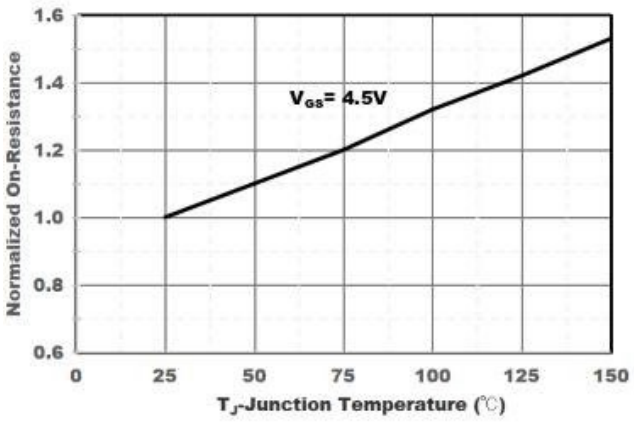


Figure6. Drain-Source on Resistance

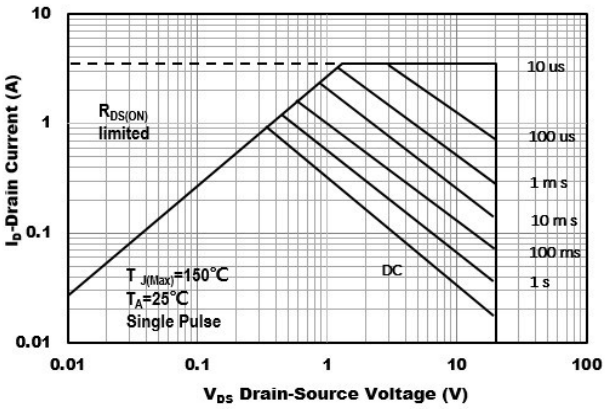
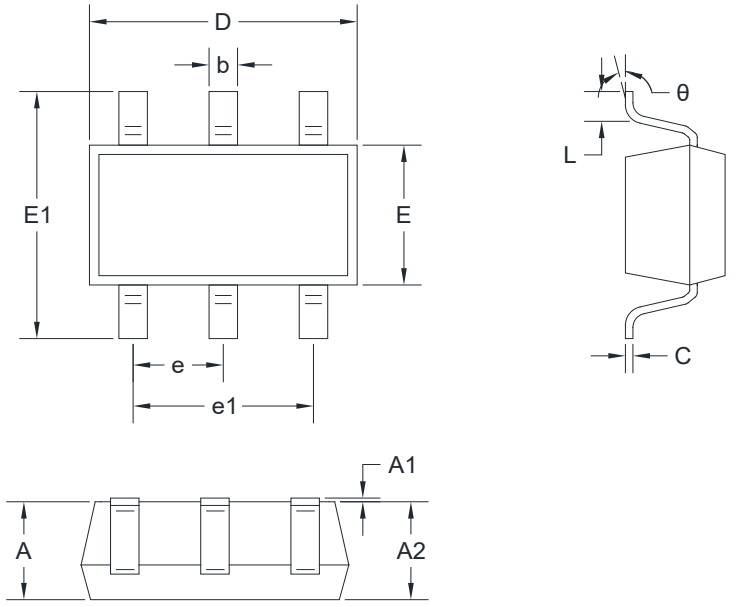


Figure7. Safe Operation Area

8. Dimension (SOT23-6L)



Unit: mm

Symbol		A	A1	A2	b	c	D
Spec	Min	1.050	0.000	1.050	0.300	0.100	2.820
	Max	1.250	0.100	1.150	0.500	0.200	3.020
Symbol		E	E1	e	e1	L	θ
Spec	Min	1.500	2.650	0.950BSC	1.800	0.300	0°
	Max	1.700	2.950		2.000	0.600	8°

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