

SuperMOS – SOT-723 20V BV_{DSS} , 150m Ω $R_{DS(on)}$, N-channel MOSFET

1. Description

The RUM002N02T2L(ES) 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 RUM002N02T2L(ES) is Pb-free.

2. Features

- 20V, $R_{DS(on)}$ =150m Ω (Typ.) @ V_{GS} =4.5V
 $R_{DS(on)}$ =200m Ω (Typ.) @ V_{GS} =2.5V
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

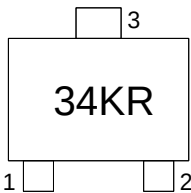
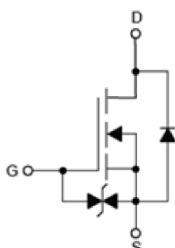
3. Applications

- 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
RUM002N02T2L(ES)	SOT-723	34KR	Halogen free	Tape & Reel	8,000 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}	± 10	V
Continuous Drain Current	$T_A=25^{\circ}\text{C}$	I_D	0.9	A
	$T_A=100^{\circ}\text{C}$		0.6	
Maximum Power Dissipation		P_D	0.23	W
Pulsed Drain Current		I_{DM}	3.6	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	$t \leq 10\text{s}$	$R_{\theta JA}$		543	$^{\circ}\text{C/W}$

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	0.4	0.65	1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =0.5A		150	165	mΩ
		V _{GS} =2.5V, I _D =0.3A		200	300	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, f=1MHz, V _{DS} =10V		60		pF
Output Capacitance	C _{OSS}			22		
Reverse Transfer Capacitance	C _{RSS}			12		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =4.5V, V _{DS} =10V, I _D =0.9A		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 =10Ω		2		ns
Rise Time	t _r			20		
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 =0.9A			1.5	V

7. Typical Characteristic

Figure1: Output Characteristics

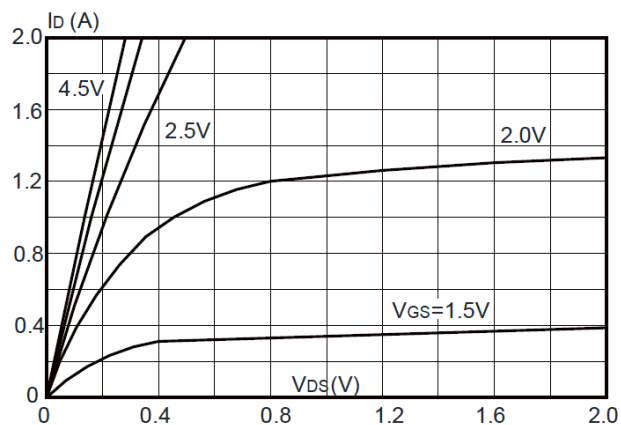


Figure 2: Typical Transfer Characteristics

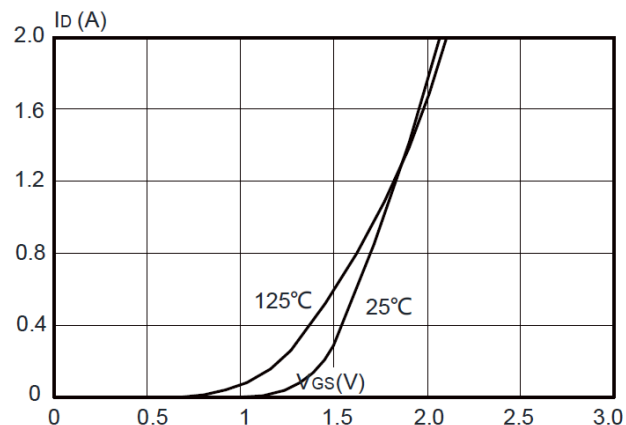


Figure 3: On-resistance vs. Drain Current

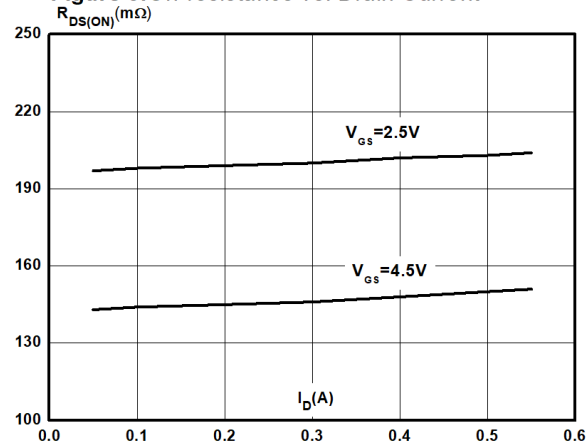


Figure 4: Body Diode Characteristics

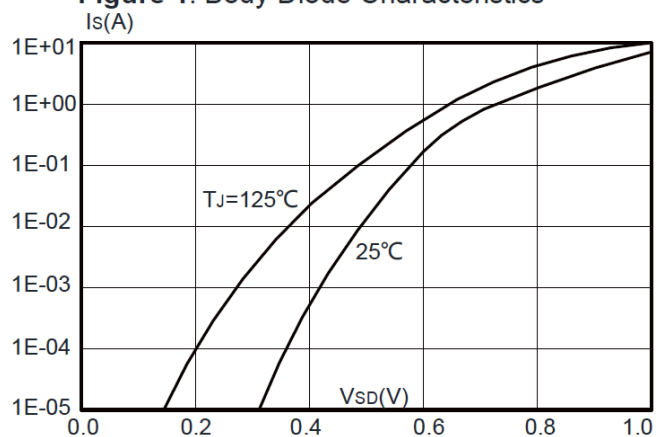


Figure 5: Capacitance Characteristics

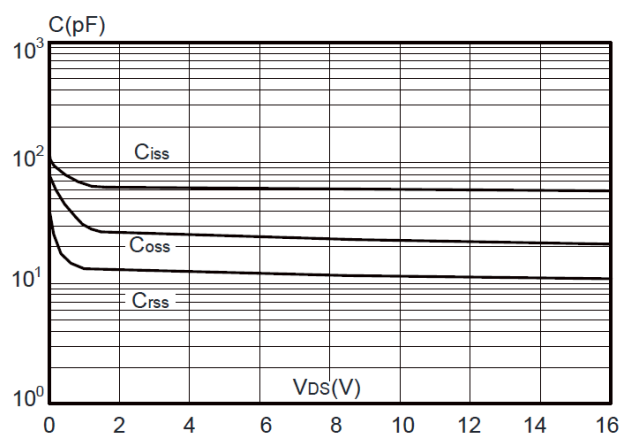
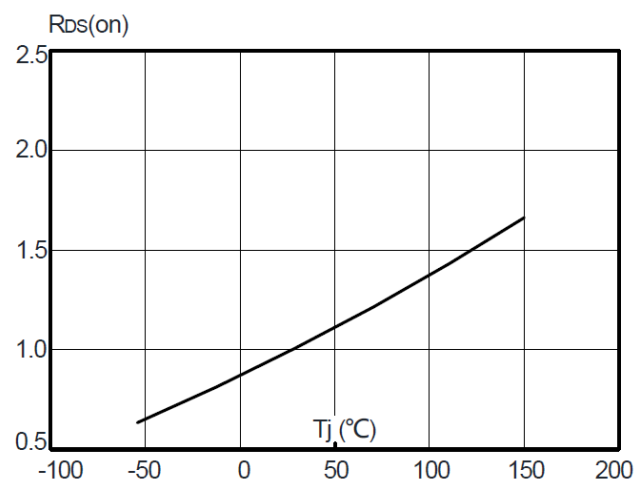
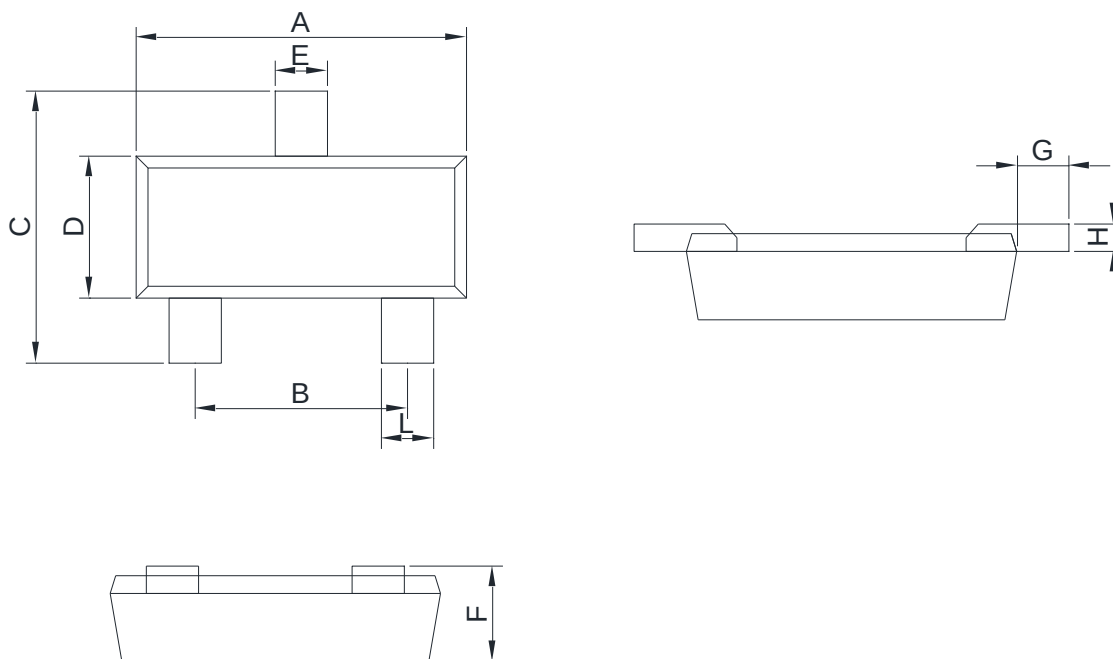


Figure 6: Normalized on Resistance vs Junction Temperature



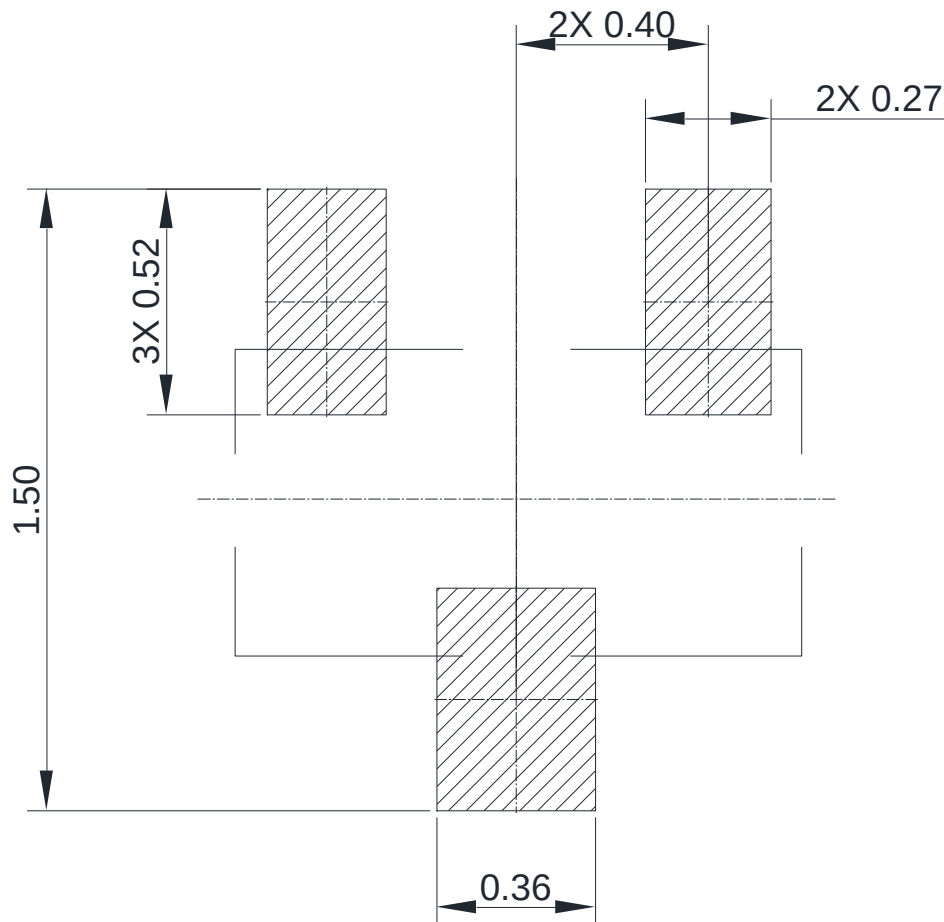
8. Dimension (SOT-723)

POD(Z)



Dimensions in Millimeters					
Symbol	Min.	Max.	Symbol	Min.	Max.
A	1.10	1.30	F	0.40	0.50
B	0.80TYP		G	0.10	0.30
C	1.10	1.30	H	0.06	0.16
D	0.70	0.90	L	0.15	0.25
E	0.15	0.35			

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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