SuperMOS – SOT-723 20V BV_{DSS}, 125mΩ $R_{DS(ON)}$, N-channel MOSFET

1. Description

The WNM2030-3/TR-ES is N-Channel enhancement MOS Field Effect Transistor. Uses advanced 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 WNM2030-3/TR-ES is Pb-free.

2. Features

- 20V, $R_{DS(ON)}$=125mΩ(Typ.) @ V_{GS}=4.5V
  $R_{DS(ON)}$=190mΩ(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

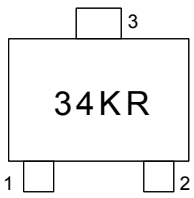
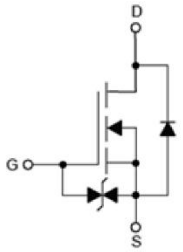
3. Applications

- 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
WNM2030-3/TR-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°C	I_D	0.9	A
	T_A=100°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	°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	$R_{\theta JA}$		543	°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	0.4	0.65	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=0.5A		125	165	mΩ
		V_{GS}=2.5V, I_D=0.3A		190	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

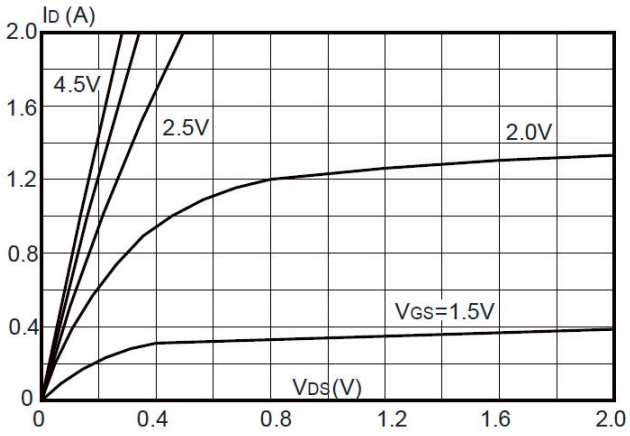


Figure 2: Typical Transfer Characteristics

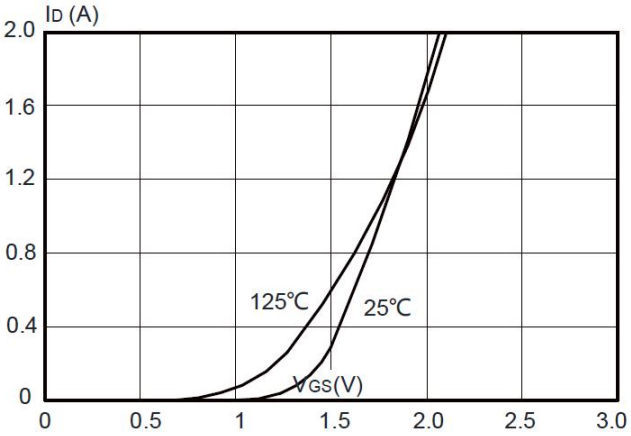


Figure 3: On-resistance vs. Drain Current

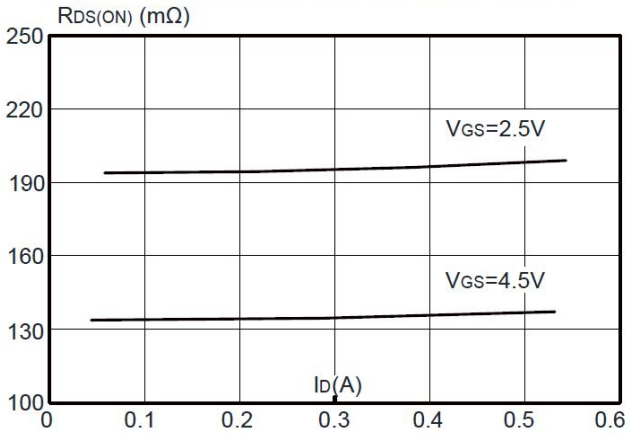


Figure 4: Body Diode Characteristics

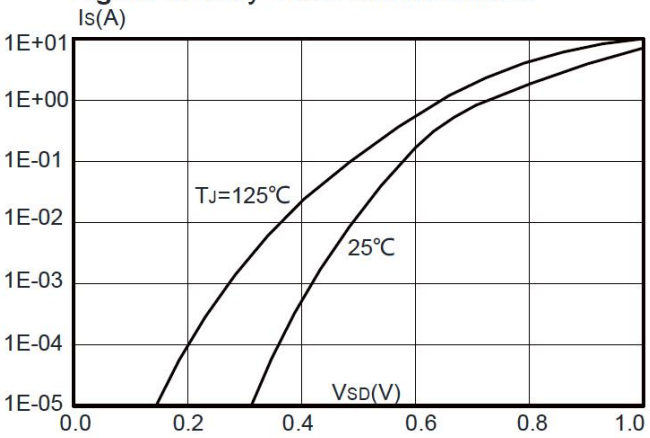


Figure 5: Gate Charge Characteristics

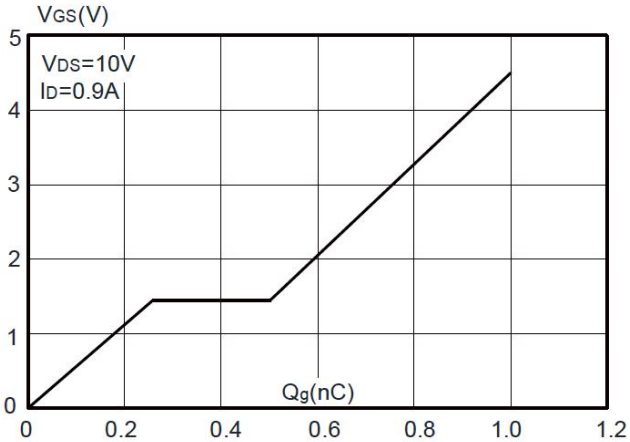


Figure 6: Capacitance Characteristics

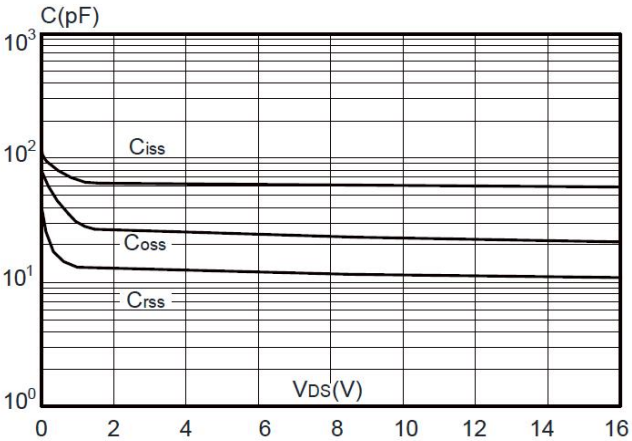


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

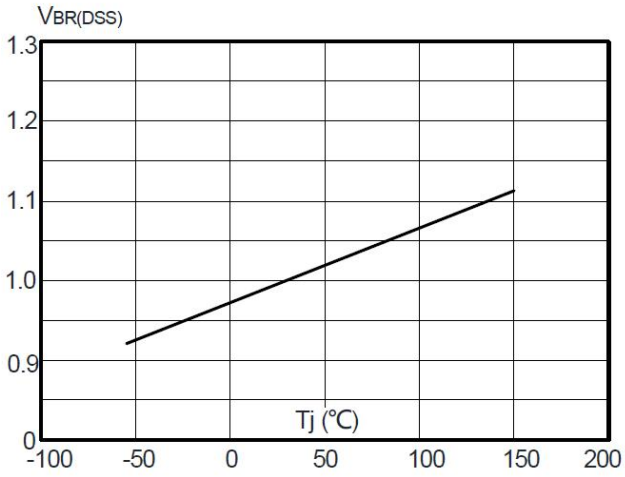


Figure 8: Normalized on Resistance vs. Junction Temperature

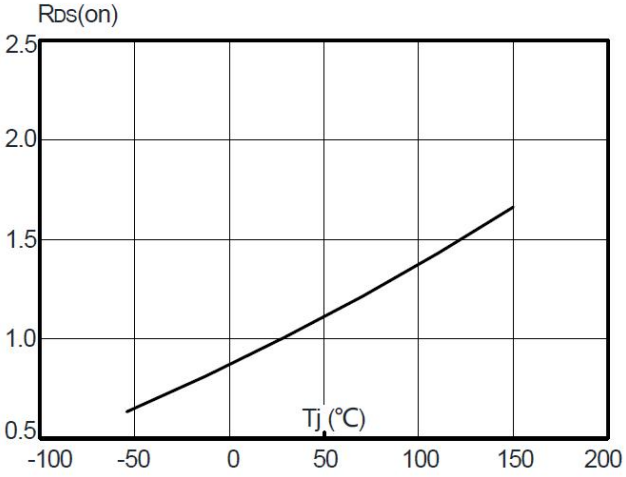


Figure 9: Maximum Safe Operating Area

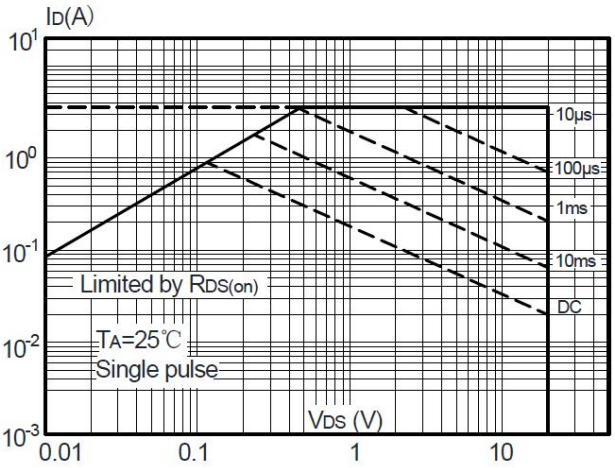


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

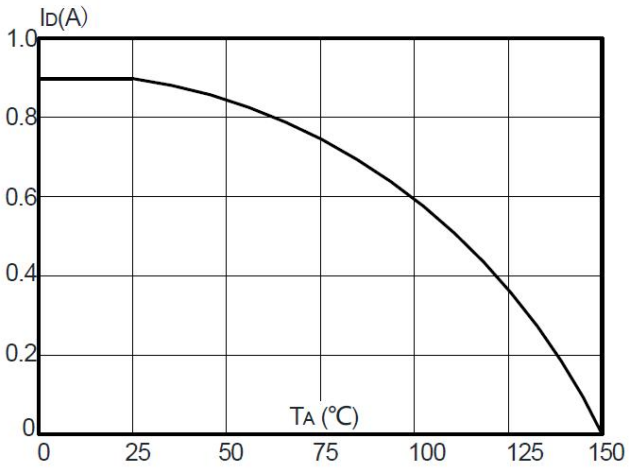
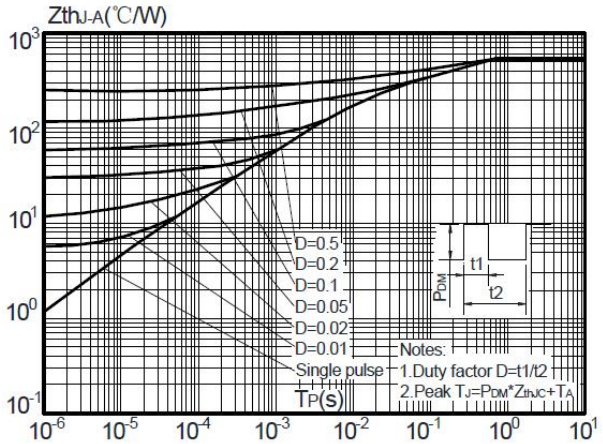
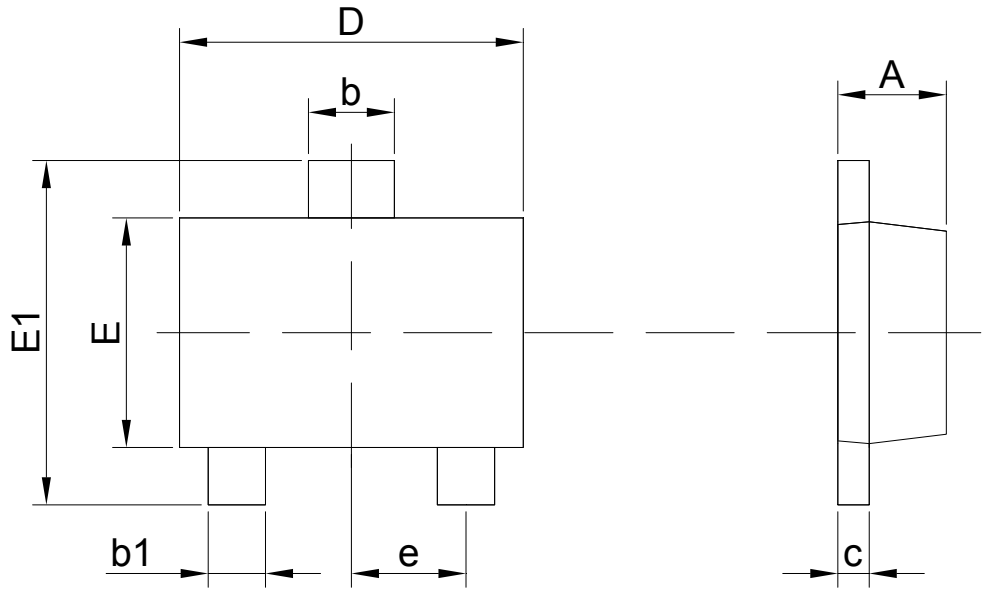


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



8. Dimension (SOT-723)



Dimensions in Millimeters					
Symbol	Min.	Max.	Symbol	Min.	Max.
A	0.37	0.50	D	1.10	1.30
b	0.20	0.30	E	0.70	0.90
b1	0.15	0.25	E1	1.05	1.35
c	0.06	0.16	e	0.400REF	

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