SuperMOS – SOT-23 -20V BV_{DSS}, 90mΩ $R_{DS(on)}$, P-channel MOSFET

1. Description

The WPM2015-3/TR-ES is P-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 WPM2015-3/TR-ES is Pb-free.

2. Features

- -20V, $R_{DS(ON)}$=90mΩ(TYP.) @V_{GS}=-4.5V
  $R_{DS(ON)}$=110mΩ(TYP.) @V_{GS}=-2.5V
- Fast Switching
- 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
WPM2015-3/TR-ES	SOT-23	2301	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7inches

Table-1 Ordering information

5. Pin Configuration and Functions

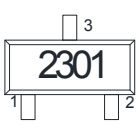
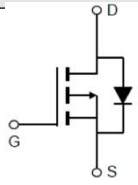
Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

Table-2 Pin configuration

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}	±8	V
Continuous Drain Current	T_A=25°C	I_D	2.3	A
	T_A=75°C		1.7	
Maximum Power Dissipation	T_A=25°C	P_D	1.4	W
	T_A=75°C		0.84	
Pulsed Drain Current		I_{DM}	9.2	A
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

Thermal resistance ratings

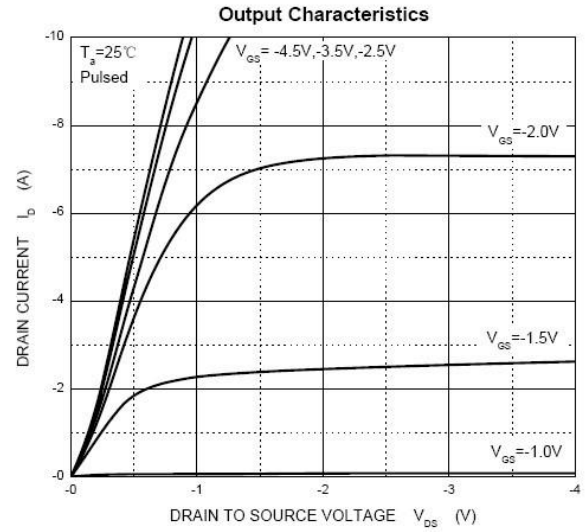
Single Operation			
Parameter	Symbol	Typical	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	90	°C/W

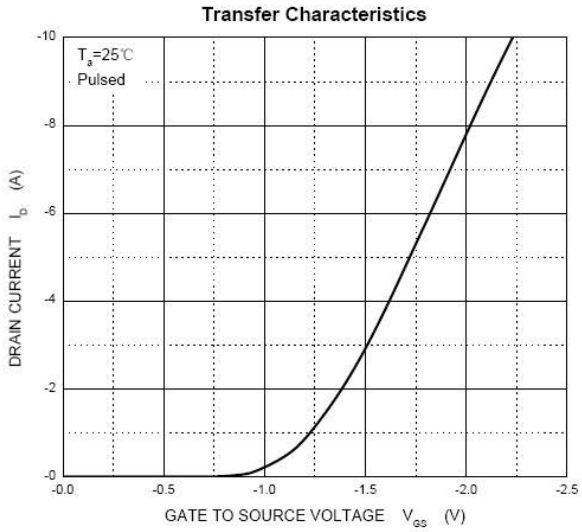
Electrical Characteristics

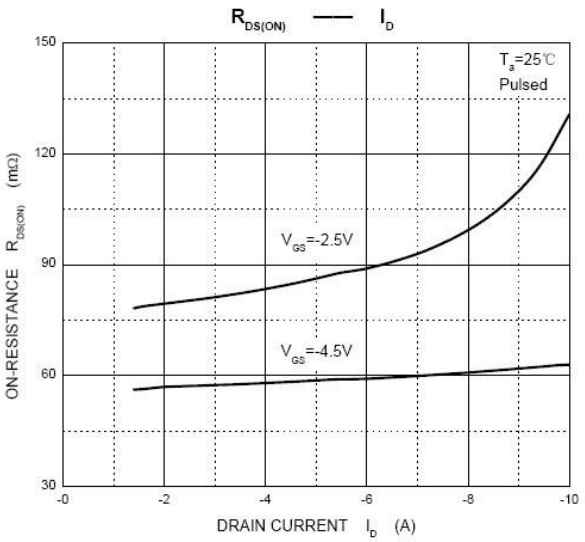
At TA = 25℃ unless otherwise specified

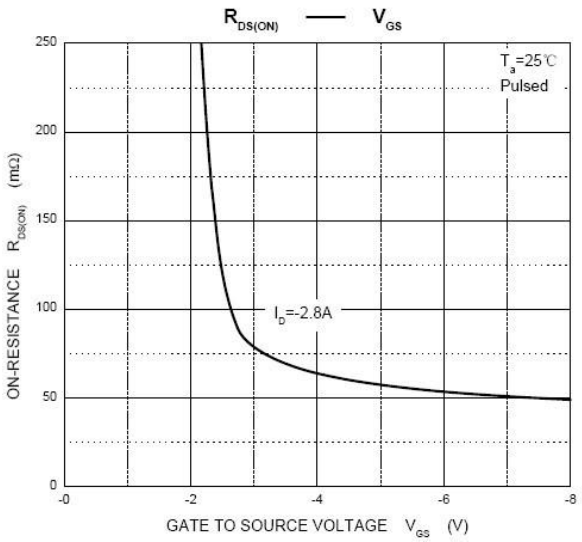
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.4	-0.7	-1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-2.3A		90	112	mΩ
		V_{GS}=-2.5V, I_D=-2A		110	142	
Forward trans conductance(a)	gfs	V_{DS}=-5V, I_D=-2.3A		6.5		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS} =-10V, f=1MHz			405	pF
Output Capacitance	C_{OSS}				75	
Reverse Transfer Capacitance	C_{RSS}				55	
Gate Resistance	R_g	f=1MHZ		6		Ω
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=-2.5V, V_{DS}=-10V, I_D=-2.3A		3.3	6	nC
Gate-to-Source Charge	Q_{GS}			0.7		
Gate-to-Drain Charge	Q_{GD}			1.3		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=-4.5V, V_{DS}=10V, R_L=10Ω，I_D=-1A, R_G=1Ω		11	20	ns
Rise Time	t_r			35	60	
Turn-Off Delay Time	$t_{d(OFF)}$			30	50	
Fall Time	t_f			10	20	
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1.0A		-0.8	-1.5	V

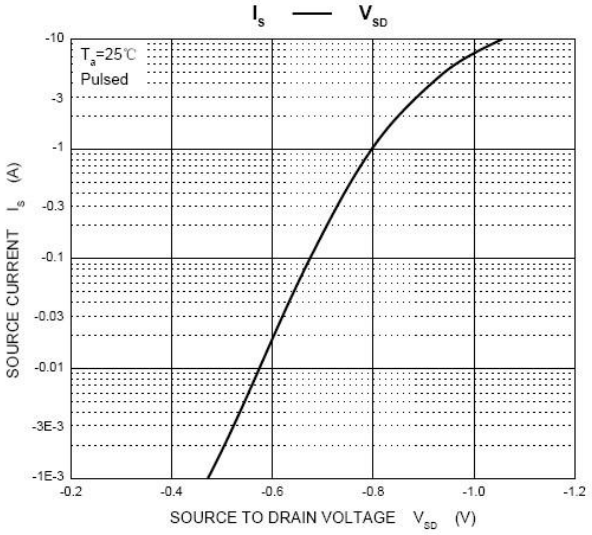
7. Typical Characteristic



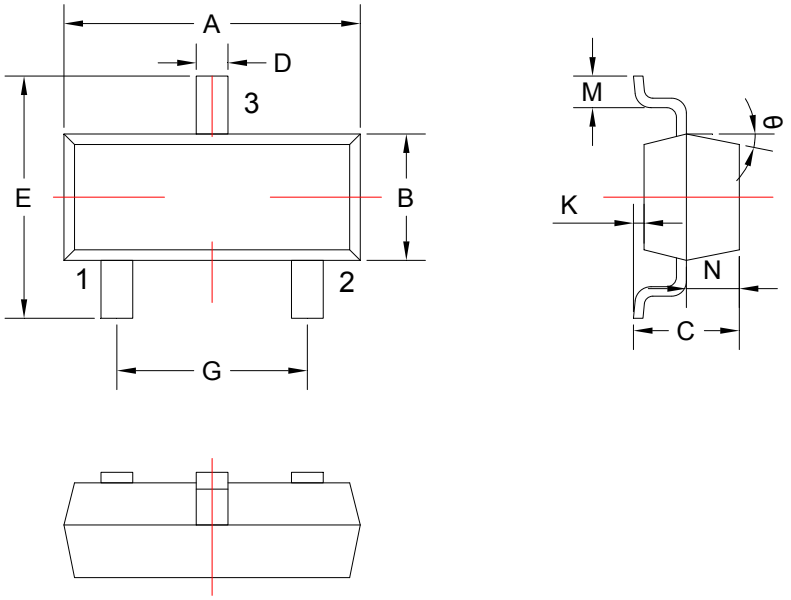








8. Dimension (SOT-23)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	2.85	3.04	G	1.80	2.00
B	1.20	1.40	K	0	0.10
C	0.90	1.10	M	0.20	-
D	0.40	0.50	N	0.50	0.70
E	2.25	2.55	θ	5°	9°

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