

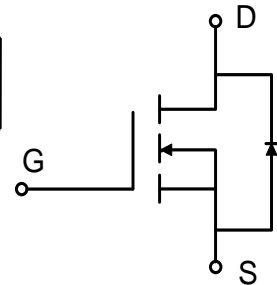
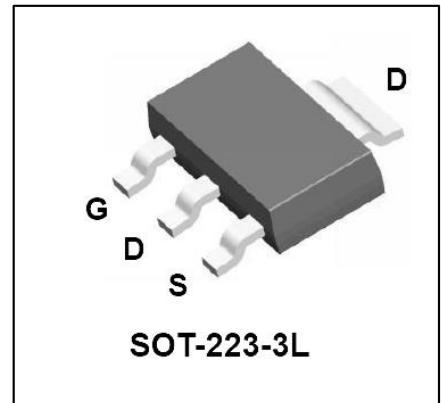
150V N-Channel Enhancement Mode Power MOSFET

Description

WMT04N15T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- $V_{DS} = 150V$, $I_D = 4A$
 $R_{DS(on)} < 160m\Omega @ V_{GS} = 10V$
- High Density Cell Design for Ultra Low $R_{DS(on)}$
- Fully Characterized Avalanche Voltage and Current
- Excellent Package for Good Heat Dissipation



Applications

- Power Switching Application
- Hard Switched and High Frequency Circuits

Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_A = 25^\circ C$	4
		$T_A = 100^\circ C$	2.5
Pulsed Drain Current ⁴	I_{DM}	16	A
Single Pulse Avalanche Energy ³	E_{AS}	8	mJ
Total Power Dissipation	P_D	2.7	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	$R_{\theta JA}$	46.3	$^\circ C/W$

Electrical Characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	150	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	I_{DSS} $V_{DS} = 150V, V_{GS} = 0V$	-	-	1	μA
	$T_J = 100^\circ\text{C}$		-	-	100	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.5	2.0	2.5	V
Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4A$	-	110	160	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1\text{MHz}$	-	1235	-	pF
Output Capacitance	C_{oss}		-	53	-	
Reverse Transfer Capacitance	C_{rss}		-	37	-	
Switching Characteristics						
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	1.0	-	Ω
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 75V,$ $I_D = 1.5A$	-	16	-	nC
Gate-Source Charge	Q_{gs}		-	4.7	-	
Gate-Drain Charge	Q_{gd}		-	5.8	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 75V$ $R_G = 6\Omega, I_D = 1.5A, R_L = 75\Omega$	-	6	-	ns
Rise Time	t_r		-	8	-	
Turn-Off Delay Time	$t_{d(off)}$		-	17	-	
Fall Time	t_f		-	12.5	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage ²	V_{SD}	$I_S = 2A, V_{GS} = 0V$	-	-	1.2	V
Continuous Source Current ^{1,5}	I_S	$V_G = V_D = 0V$, Force Current	-	-	4	A

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 1\text{mH}, I_{AS} = 4A$
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

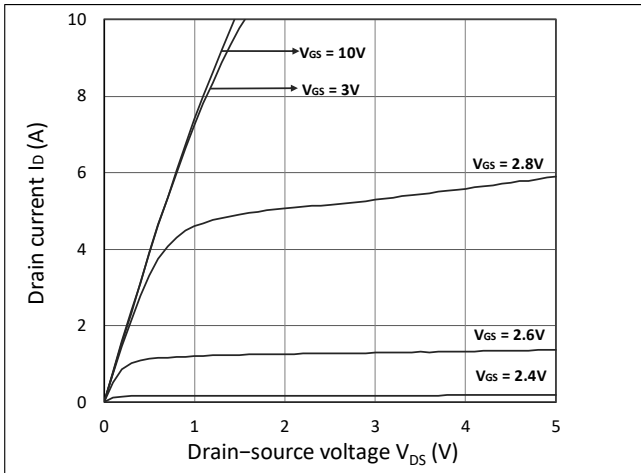


Figure 1. Output Characteristics

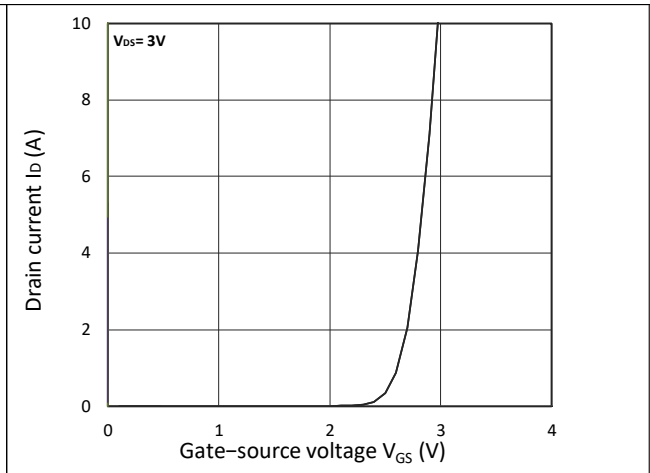


Figure 2. Transfer Characteristics

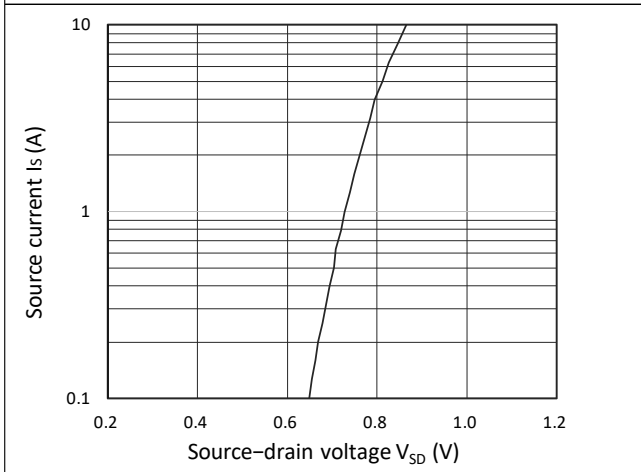


Figure 3. Forward Characteristics of Reverse

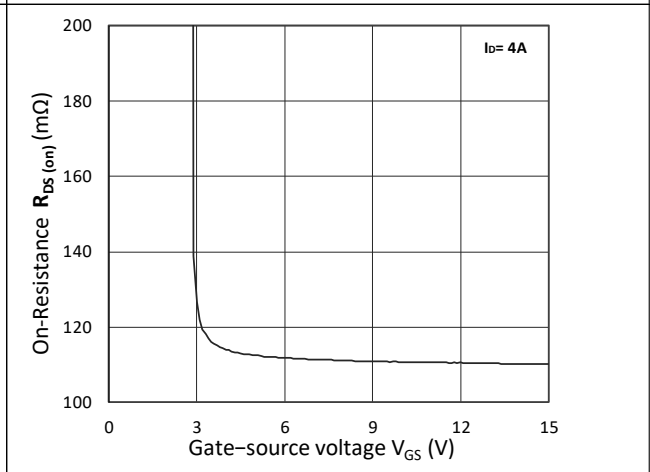


Figure 4. $R_{DS(on)}$ vs. V_{GS}

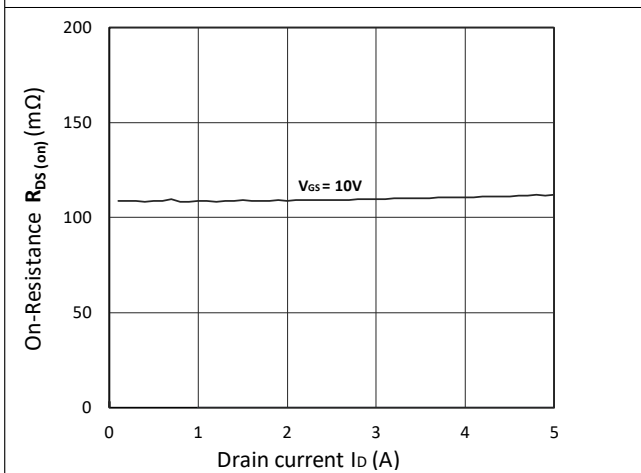


Figure 5. $R_{DS(on)}$ vs. I_D

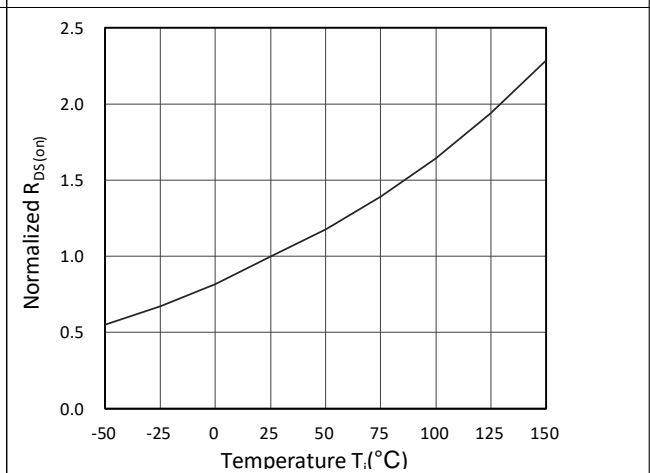


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

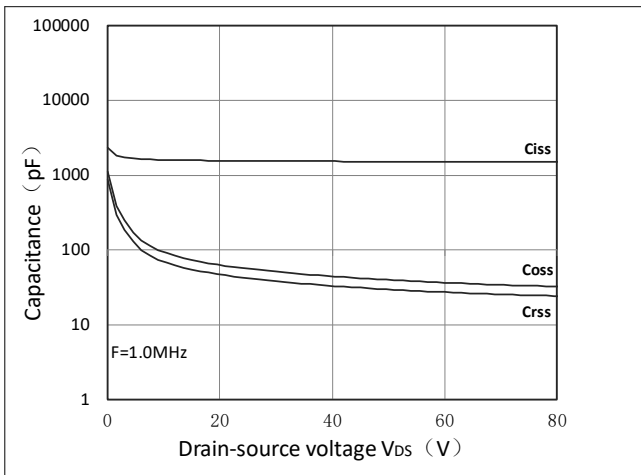


Figure 7. Capacitance Characteristics

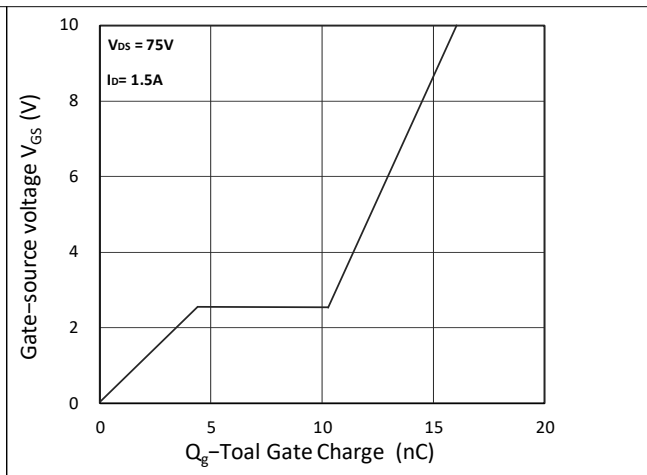


Figure 8. Gate Charge Characteristics

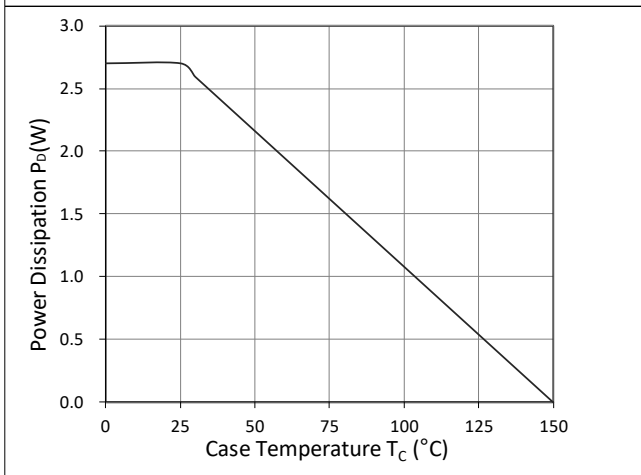


Figure 9. Power Dissipation

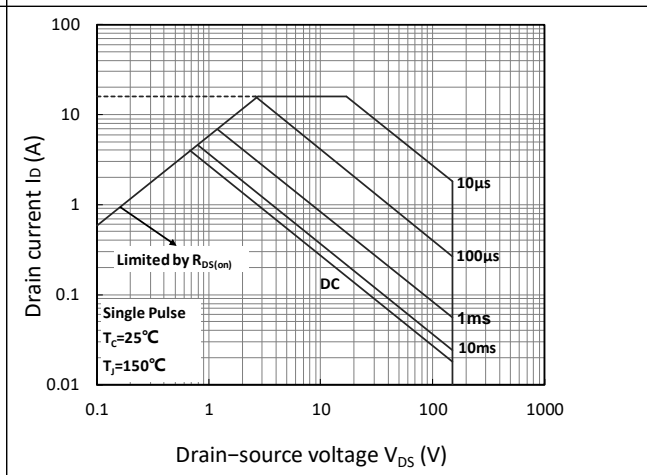


Figure 10. Safe Operating Area

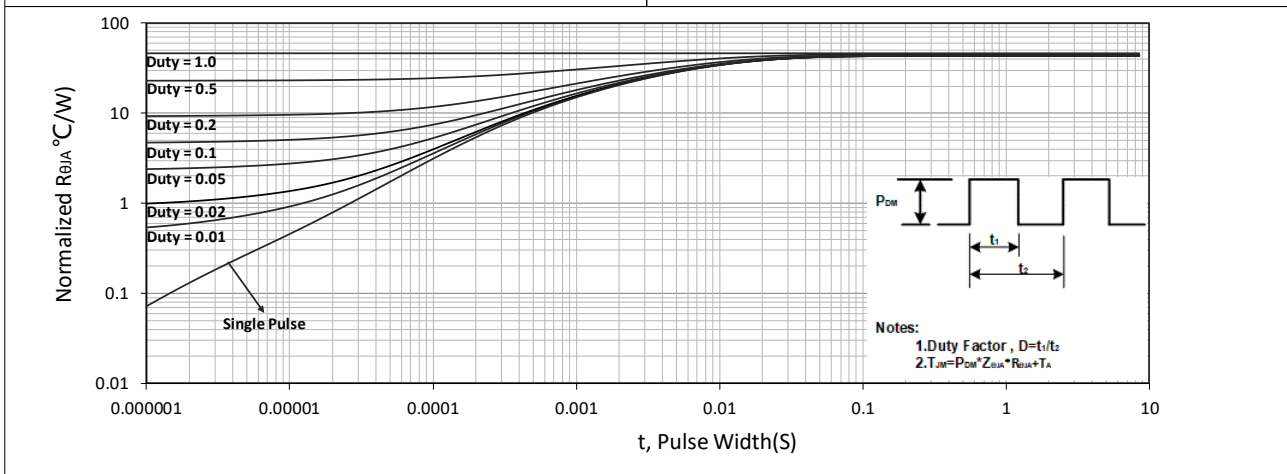


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

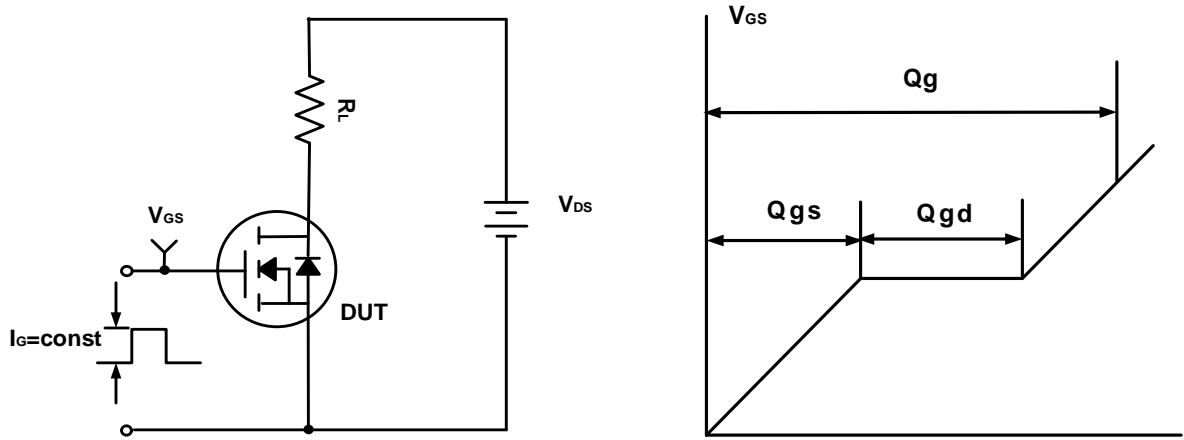


Figure A. Gate Charge Test Circuit & Waveforms

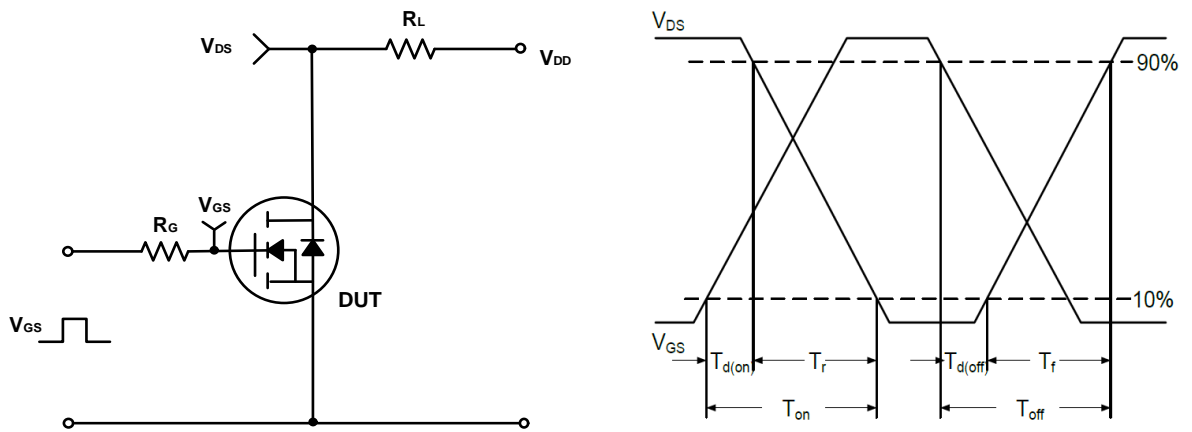


Figure B. Switching Test Circuit & Waveforms

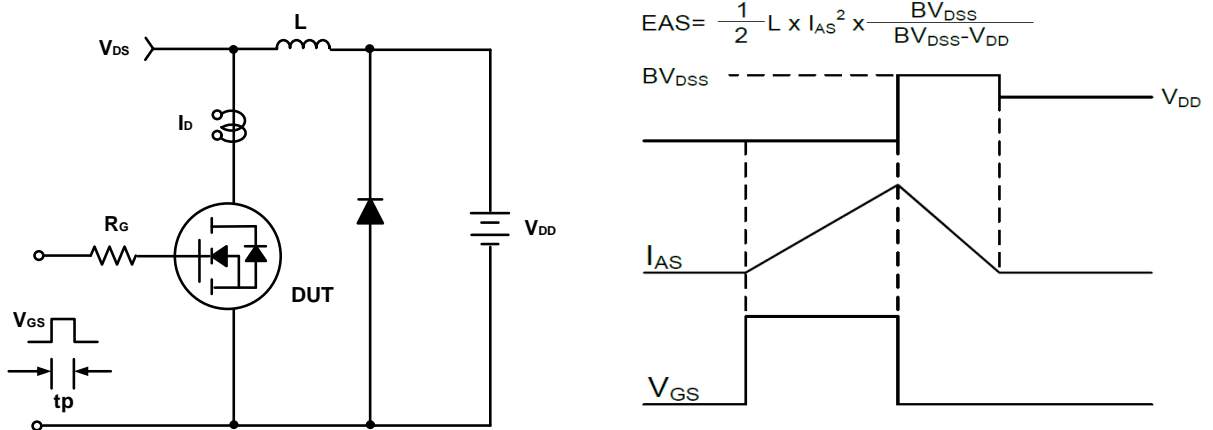
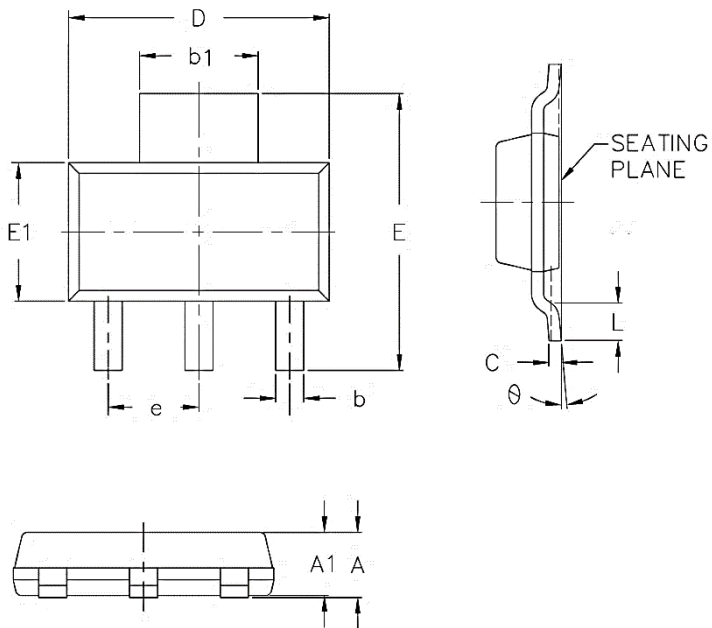


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for SOT-223-3L

COMMON DIMENSIONS

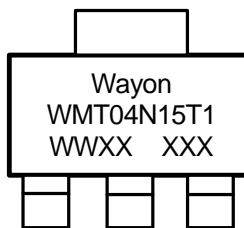


SYMBOL	MM	
	MIN	MAX
A	-	1.80
A1	1.45	1.75
b	0.60	0.84
b1	2.90	3.10
C	0.23	0.35
D	6.20	6.70
E	6.70	7.30
E1	3.30	3.70
e	2.30BSC	
L	0.80	-
θ	0°	10°

Ordering Information

Part	Package	Marking	Packing method
WMT04N15T1	SOT-223-3L	WMT04N15T1	Tape and Reel

Marking Information



WMT04N15T1 = Device code

WWXX XXX= Date code

Contact Information

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For additional information, please contact your local Sales Representative.

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