WMT04N10TS

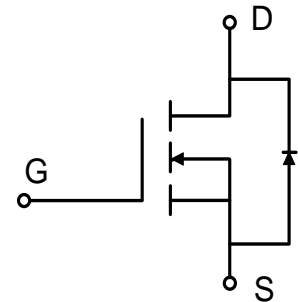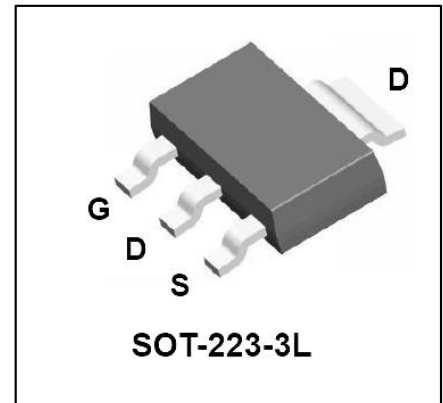## 100V N-Channel Enhancement Mode Power MOSFET

Description

WMT04N10TS 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}= 100V, I_D = 3.5A

  $R_{DS(on)}$ < 130mΩ @ V_{GS} = 10V

  $R_{DS(on)}$ < 190mΩ @ V_{GS} = 4.5V
- High Speed Power Smooth Switching, Logic Level
- Low Gate Charge
- 100% EAS Guaranteed

Applications

- DC/DC Converter
- LED Backlighting
- Motor Control

SOT-223-3L

RoHS compliant

Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	3.5	A
	T_A=100°C		2.2	
Pulsed Drain Current[1]		I_{DM}	14	A
Single Pulse Avalanche Energy[2]		EAS	5.06	mJ
Total Power Dissipation	T_A=25°C	P_D	3.1	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[3]	$R_{θJA}$	40.3	°C/W

Electrical Characteristics (T_J = 25°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 = 250µA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	-	-	1	µA
	T_J=100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1	1.65	2.5	V
Drain-Source On-Resistance[4]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 3A	-	95	130	mΩ
			V_{GS} = 4.5V, I_D = 1A	-	135	190	
Forward Transconductance[4]		g_{fs}	V_{DS} = 10V, I_D = 3A	-	4	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{GS} =0V, V_{DS} = 50V, f =1MHz	-	200	-	pF
Output Capacitance		C_{oss}		-	30	-	
Reverse Transfer Capacitance		C_{rss}		-	2.5	-	
Gate Resistance		R_g	f =1MHz	-	6	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS} = 50V, I_D= 3A	-	4	-	nC
Gate-Source Charge		Q_{gs}		-	0.9	-	
Gate-Drain Charge		Q_{gd}		-	1.1	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 50V, R_G = 3Ω, I_D = 3A	-	12.6	-	ns
Rise Time		t_r		-	19	-	
Turn-Off Delay Time		$t_{d(off)}$		-	20	-	
Fall Time		t_f		-	27.8	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = 3A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_A=25°C	I_S	-	-	-	3.5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

2. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=4.5A.

3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

5. This value is guaranteed by design hence it is not included in the production test.
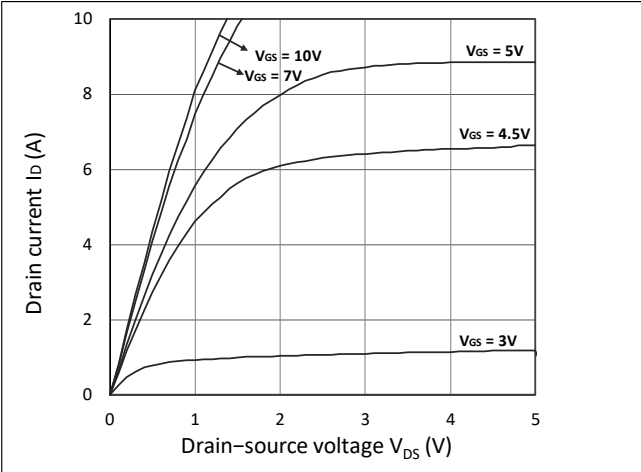
Typical Characteristics
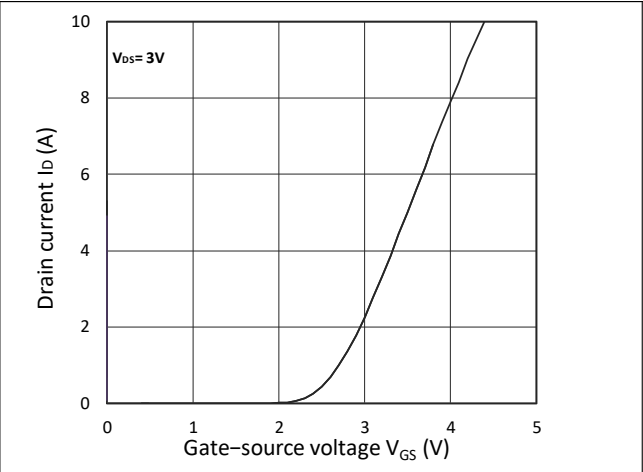

Figure 1. Output Characteristics
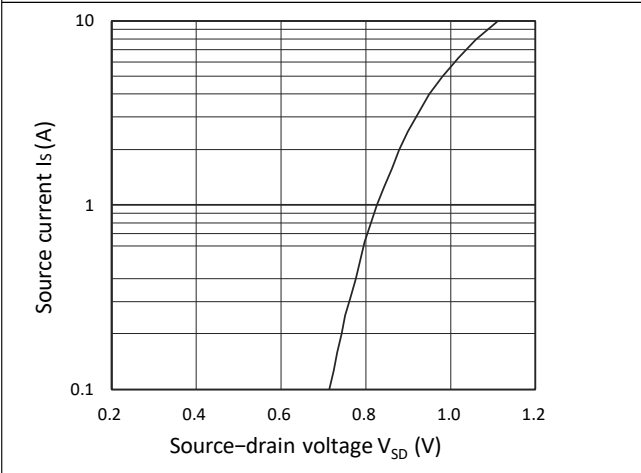

Figure 2. Transfer Characteristics

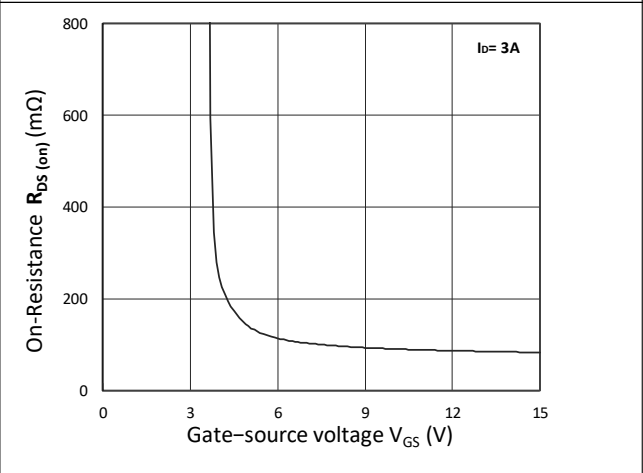Figure 3. Forward Characteristics of Reverse
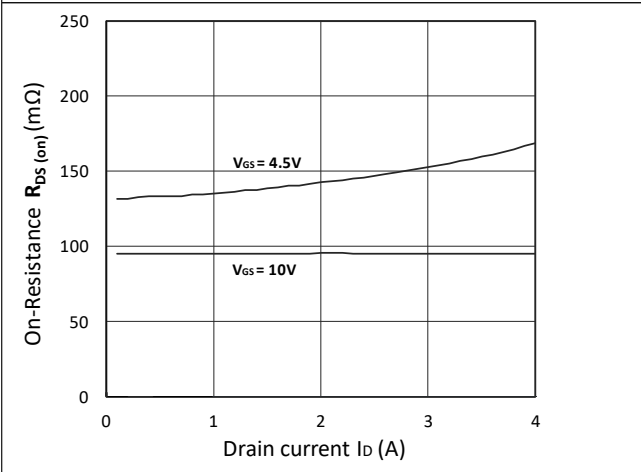

Figure 4. $R_{DS(ON)}$ vs. V_{GS}

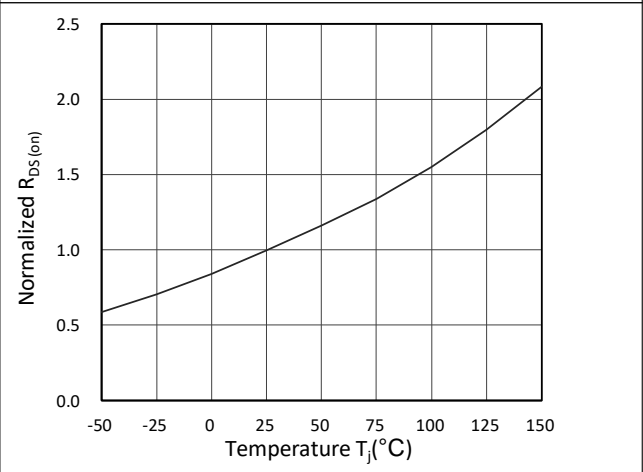Figure 5. $R_{DS(ON)}$ vs. I_D

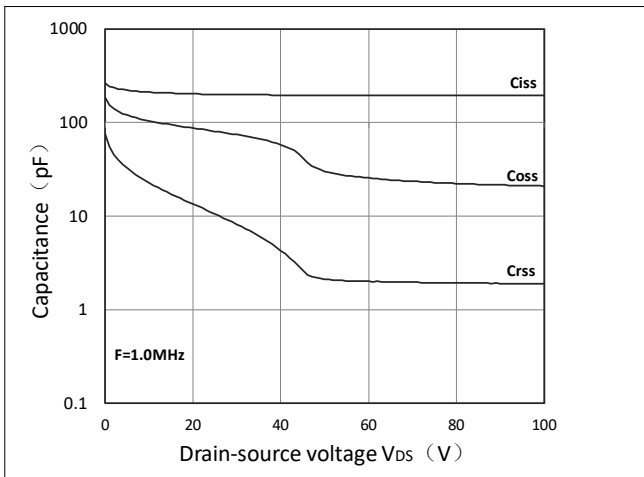Figure 6. Normalized $R_{DS(on)}$ vs. Temperature
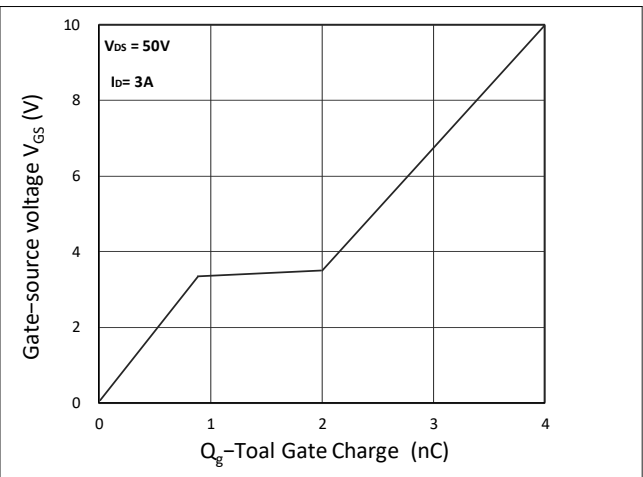
Figure 7. Capacitance Characteristics

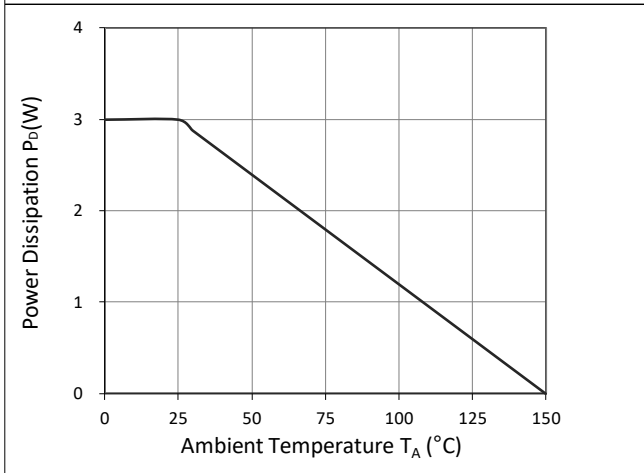Figure 8. Gate Charge Characteristics
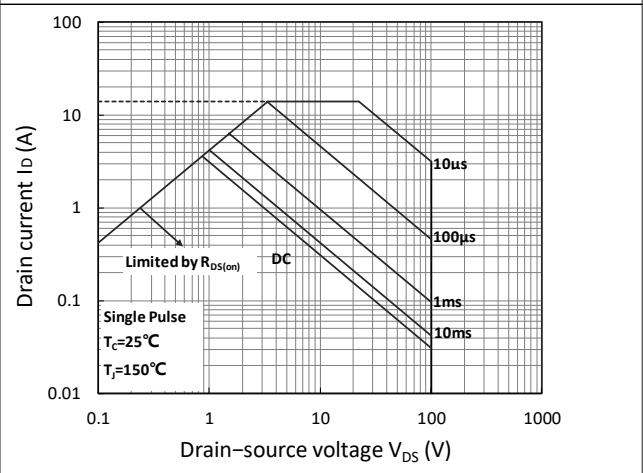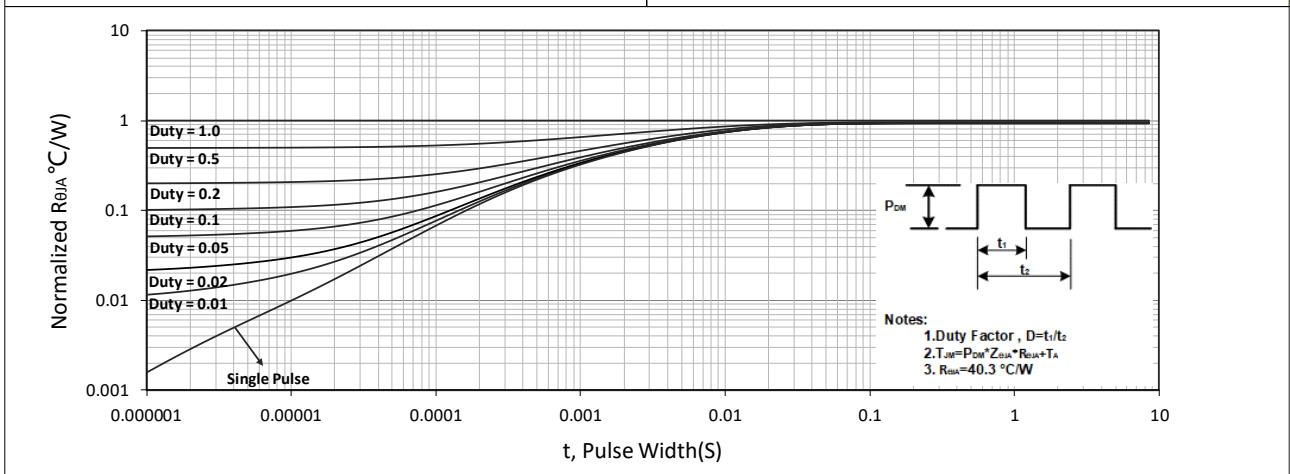
Figure 9. Power Dissipation

Figure10. Safe Operating Area

Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

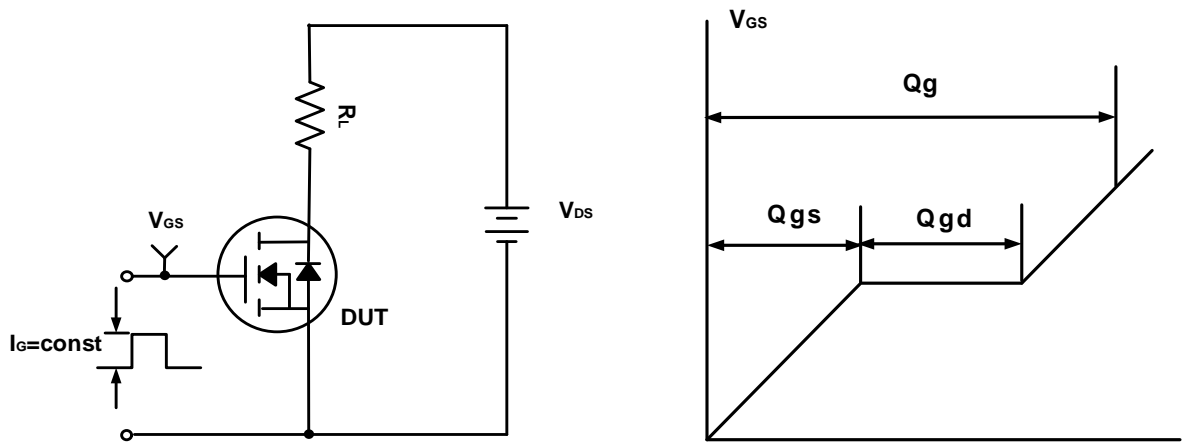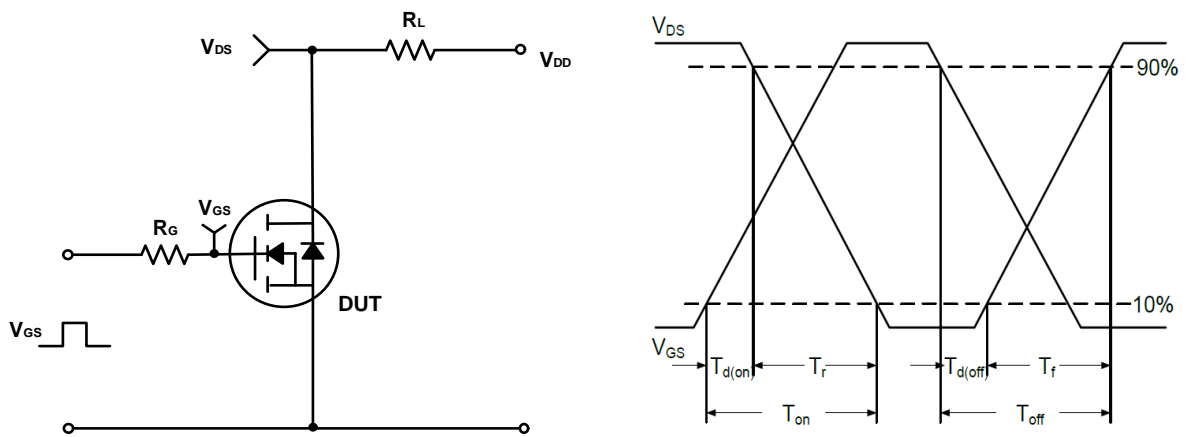**Figure A. Gate Charge Test Circuit & Waveforms**
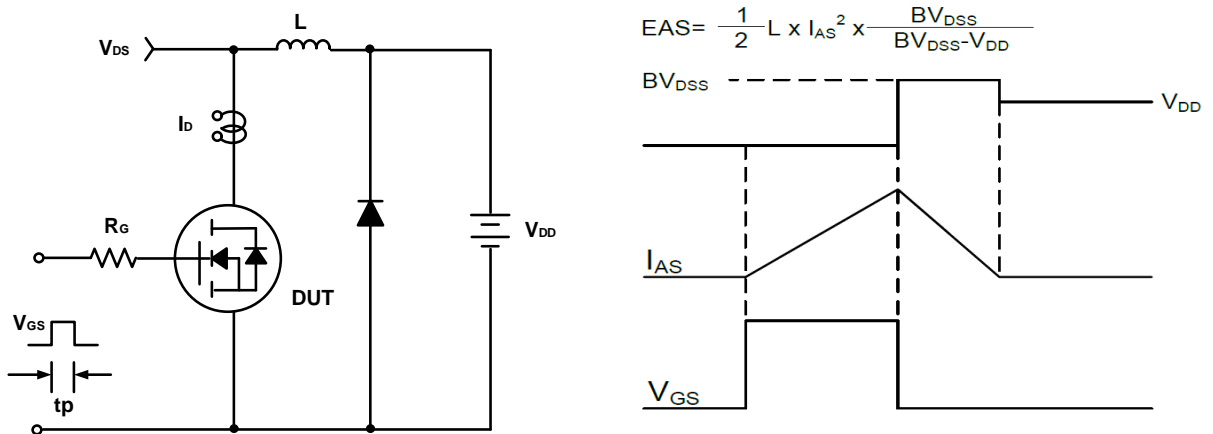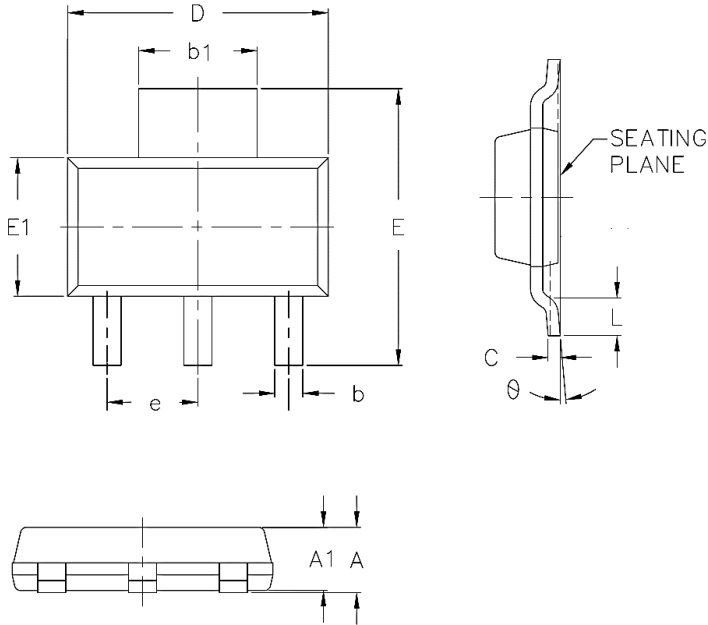

Figure B. Switching Test Circuit & Waveforms

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

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
WMT04N10TS	SOT-223-3L	WMT04N10TS	Tape and Reel

Marking Information

Wayon
WMT04N10TS
WWXX   XXX

WMT04N10TS= Device code

WWXX XXX= Date code

Contact Information

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