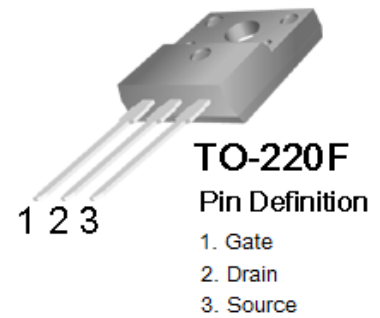
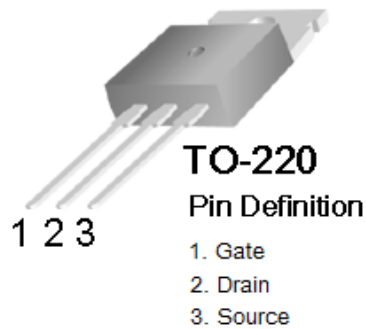


800V N-Channel Power MOSFET

Features

- High Voltage: $BV_{DSS}=800V(\text{Min.})$
- $I_D : 4A$
- Robust high voltage termination
- Avalanche energy specified
- Improved dv/dt capability
- Low gate charge

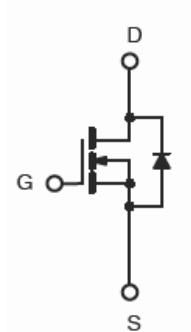


Application

- Ballast Bridge
- Switch Mode Power Supplier
- Power Factor Correction
- Lighting

Ordering Information

Type NO	Marking	Package Code
WMX4N80	4N80X	TO-220
WMF4N80	4N80F	TO-220F



Absolute Maximum Ratings

($T_C=25^\circ\text{C}$)

Parameter	Symbol	WMX4N80 / WMF4N80		Unit	
Drain-Source Voltage	V_{DSS}	800		V	
Gate-Source Voltage	V_{GS}	± 30		V	
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	4	4*	A
		$T_C = 100^\circ\text{C}$	2.5	2.5*	A
Pulsed Drain Current (Note 1)	I_{DM}	16	16*	A	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	76		mJ	
Repetitive Avalanche Current (Note 1)	I_{AR}	4		A	
Repetitive Avalanche Energy (Note 1)	E_{AR}	12.3		mJ	
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	123	38.6	W
		Derate above 25°C	0.98	0.31	W/ $^\circ\text{C}$
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5		V/ns	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150		$^\circ\text{C}$	
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300		$^\circ\text{C}$	

* Limited by maximum junction temperature

Parameter	Symbol	Rating		Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	1.01	3.23	$^\circ\text{C}/\text{W}$
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	$^\circ\text{C}/\text{W}$

* Note: Surface mounted on FR4 board $t \leq 10\text{sec}$

Electrical Characteristics

(Tc=25°C)

Parameter	Symbol	Test condition	Min	Typ	Max	Units
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OFF

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	--	--	10	μA
		$V_{DS} = 640\text{ V}, T_C = 125^\circ\text{C}$	--	--	100	μA
Forward Gate-Source Leakage Current	I_{GSSF}	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
Reverse Gate-Source Leakage Current	I_{GSSR}	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

ON

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}$	--	2.5	3.0	Ω
Forward Transconductance ^(Note 4)	g_{FS}	$V_{DS} = 30\text{ V}, I_D = 2\text{ A}$	--	3.7	--	S

DYNAMIC

Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	1020	--	pF
Output Capacitance	C_{oss}		--	77	--	pF
Reverse Transfer Capacitance	C_{rss}		--	10.3	--	pF

SWITCHING

Turn-On Delay Time ^(Note 4,5)	$t_{d(on)}$	$V_{DD} = 400\text{ V}, I_D = 4\text{ A},$ $R_G = 25\ \Omega$	--	22	--	ns
Turn-On Rise Time ^(Note 4,5)	t_r		--	25	--	ns
Turn-Off Delay Time ^(Note 4,5)	$t_{d(off)}$		--	84	--	ns
Turn-Off Fall Time ^(Note 4,5)	t_f		--	27	--	ns
Total Gate Charge ^(Note 4,5)	Q_g	$V_{DS} = 640\text{ V}, I_D = 4\text{ A},$ $V_{GS} = 10\text{ V}$	--	21	--	nC
Gate-Source Charge ^(Note 4,5)	Q_{gs}		--	3.2	--	nC
Gate-Drain Charge ^(Note 4,5)	Q_{gd}		--	7.8	--	nC

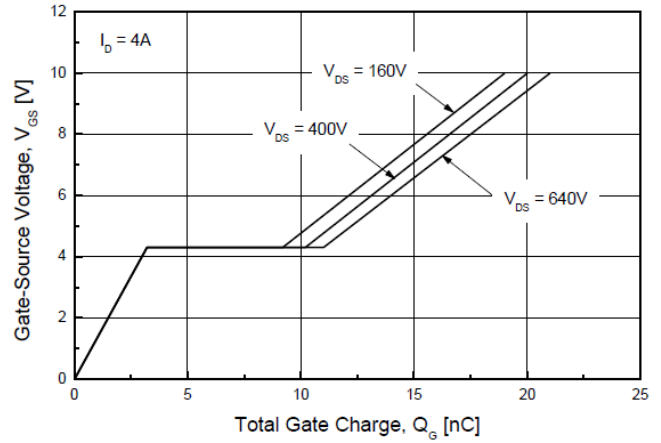
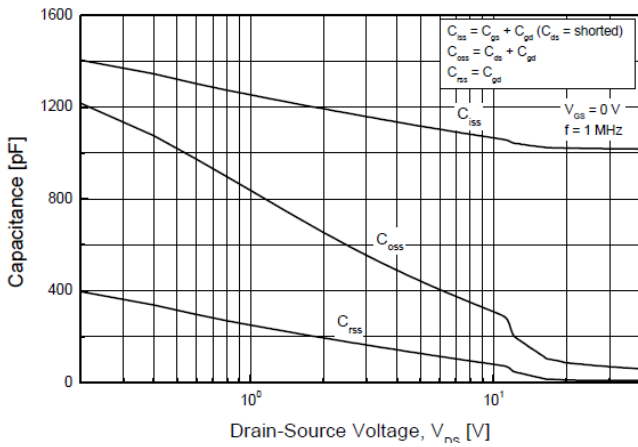
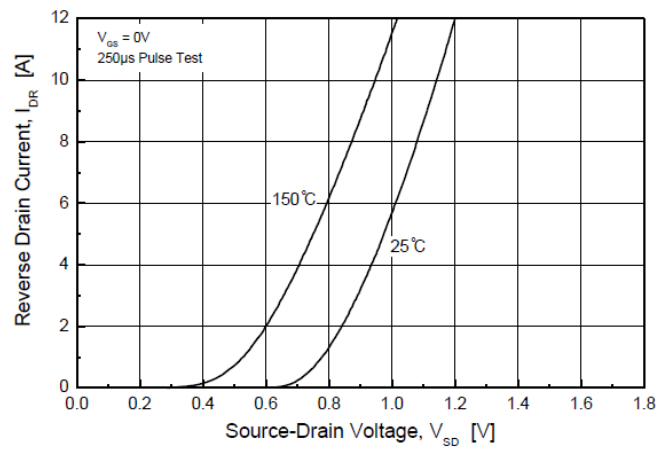
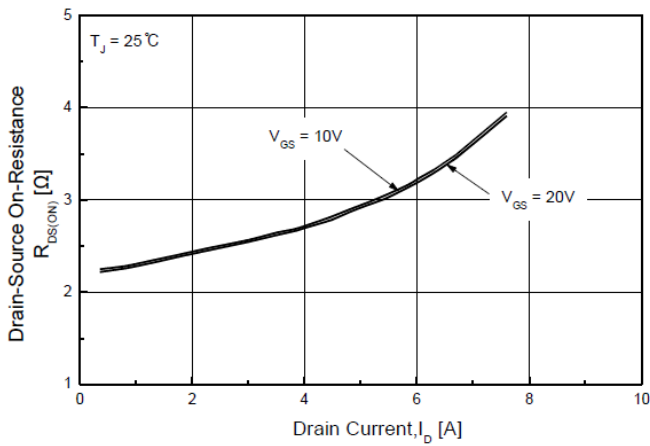
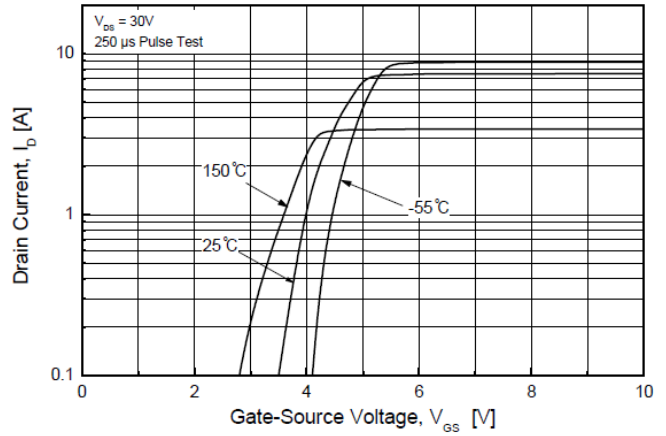
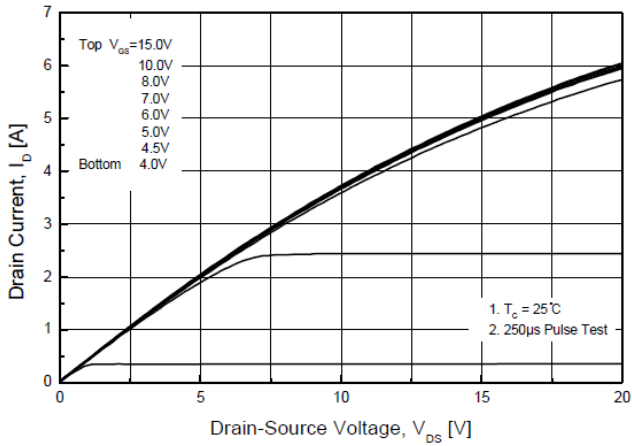
SOURCE DRAIN DIODE

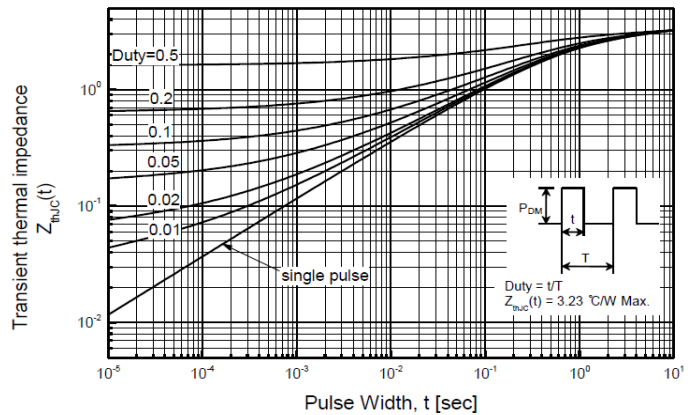
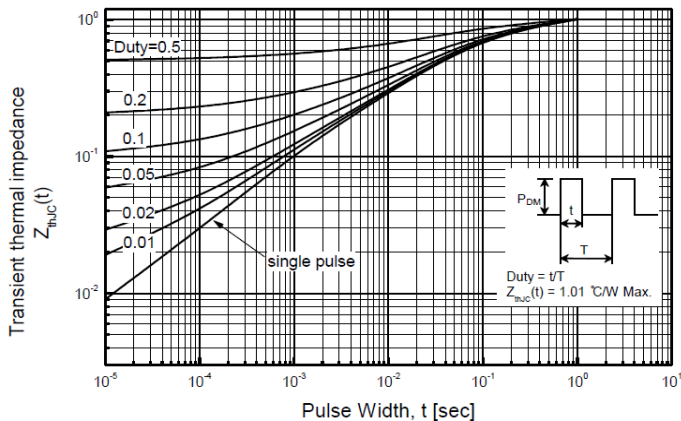
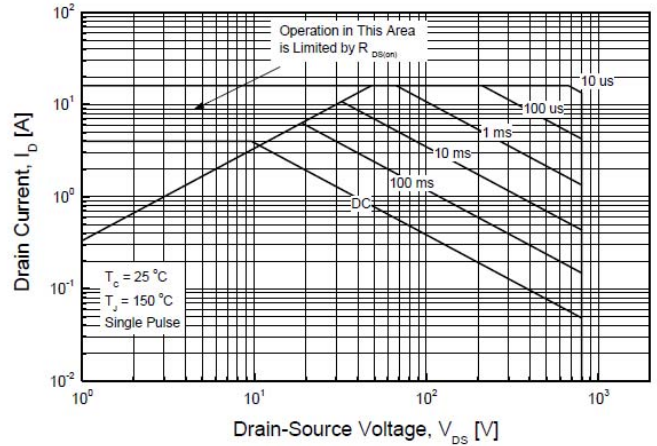
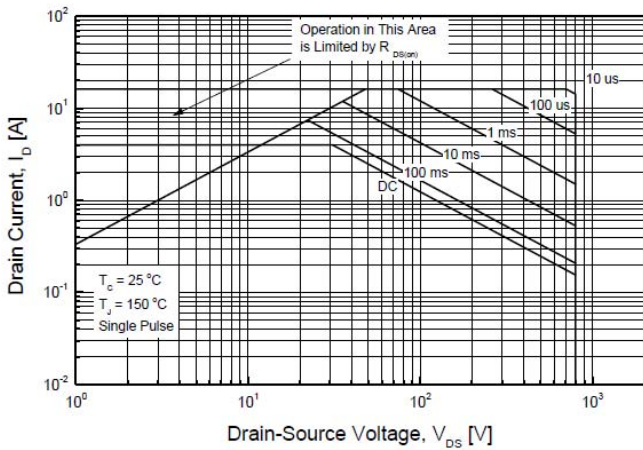
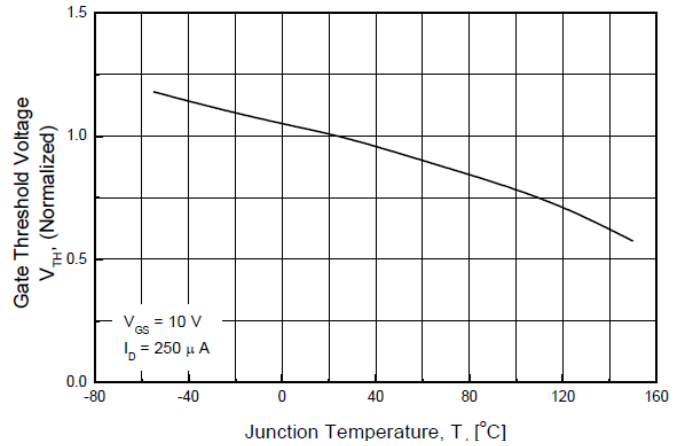
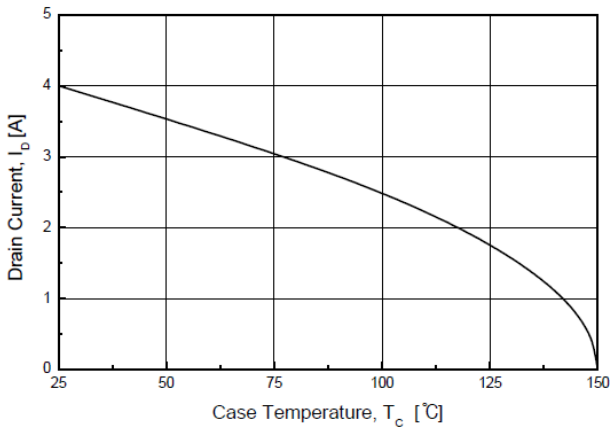
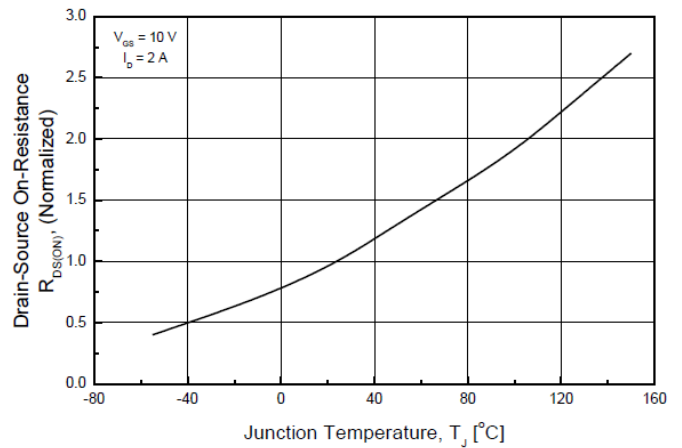
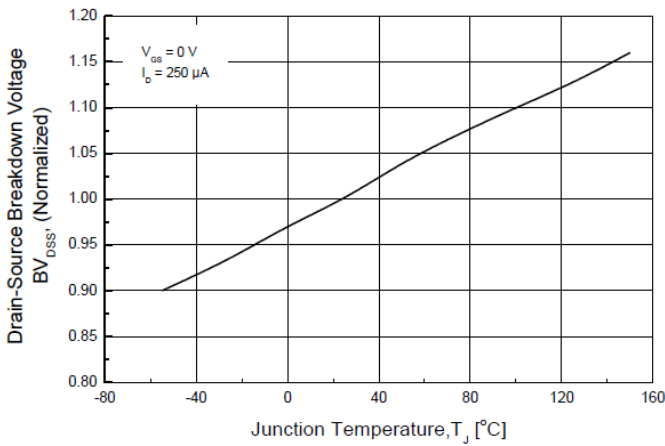
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	4	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	16	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 4\text{ A}$	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	t_{rr}	$V_{GS} = 0\text{ V}, I_S = 4\text{ A}$ $dI_F / dt = 100\text{ A}/\mu\text{s}$	--	404	--	ns
Reverse Recovery Charge ^(Note 4)	Q_{rr}		--	2.8	--	μC

Note :

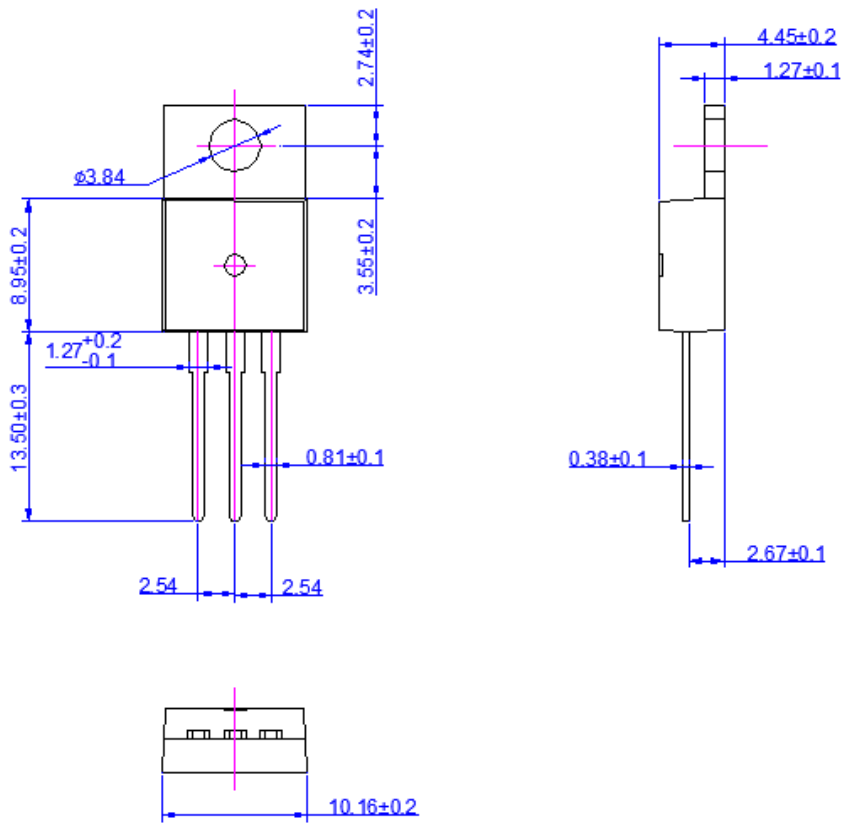
1. Repeated rating : Pulse width limited by safe operating area
2. $L = 8.9\text{mH}, I_{AS} = 4\text{ A}, V_{DD} = 50\text{ V}, R_G = 25\ \Omega,$ Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 4\text{ A}, di/dt \leq 200\text{ A}/\mu\text{s}, V_{DD} \leq BV_{DS},$ Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse width $\leq 300\ \mu\text{s},$ Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature Typical Characteristics

Electrical Characteristic Curves

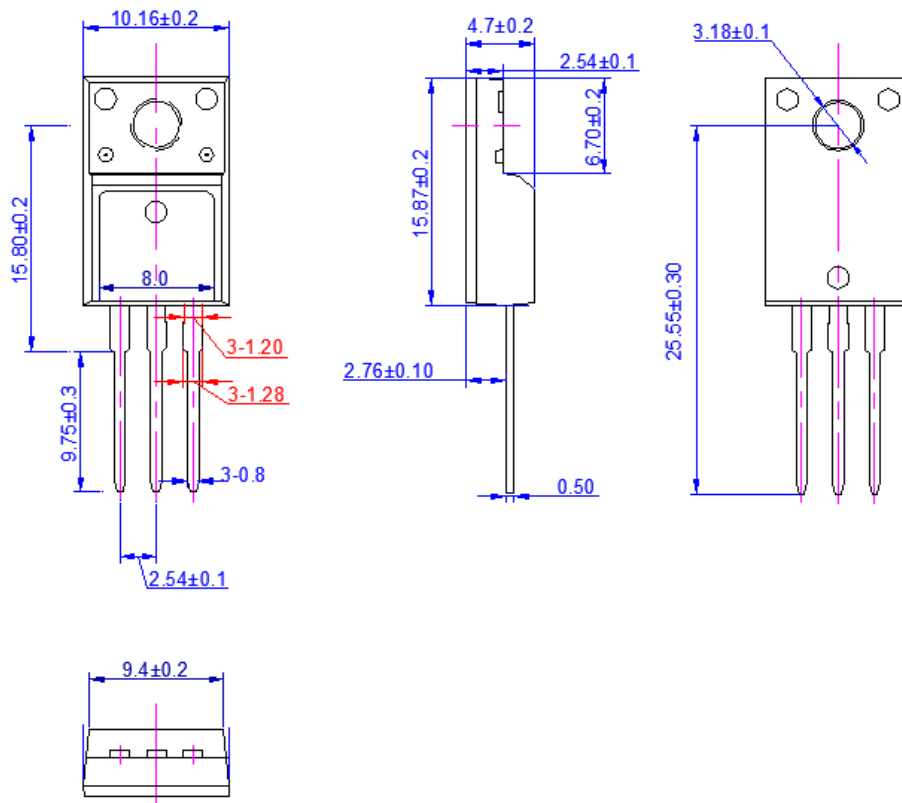




Outline Dimension : TO-220

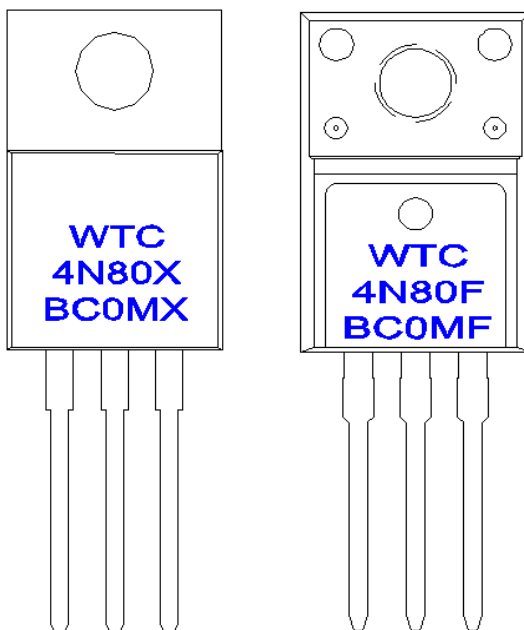


Outline Dimension : TO-220F



Unit : mm

Marking Diagram



First Line	WTC	Company Name	
Second Line	4N80X / 4N80F	Product Code	
Third Line	BC0MX / BC0MF	1st (Year Code)	A-2010 B-2011 C-2012 ...
		2nd (Month Code)	A-Jan B-Feb C-Mar D-Apr E-May F-Jun G-Jul H-Aug I-Sep J-Oct K-Nov L-Dec
		3rd (Lot Code)	0-1 , A-9
		4th (Product Code)	M-MOS , T-Transistor
		5th (Package Code)	D-TO-252, I-TO-251, X-TO-220, F-TO-220F
		6th (Spec Code)	(Reserve)