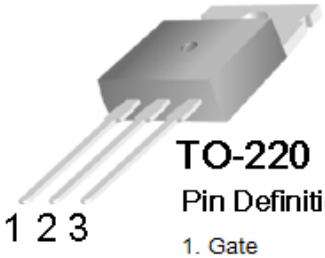
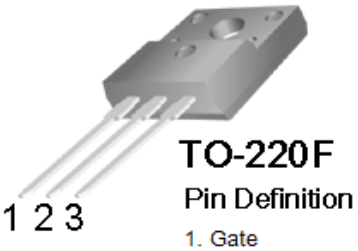
800V N-Channel Power MOSFET

Features

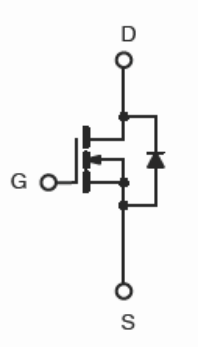
- High Voltage: BV_{DSS}=800V(Min.)
- I_D : 8A
- Robust high voltage termination
- Avalanche energy specified
- Improved dv/dt capability
- Low gate charge





Application

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



Ordering Information

Type NO	Marking	Package Code
WMX8N80	8N80X	TO-220
WMF8N80	8N80F	TO-220F

Absolute Maximum Ratings (Tc=25°C)

Parameter		Symbol	WMX8N80 / WMF8N80		Unit
Drain-Source Voltage		V_{DSS}	800		V
Gate-Source Voltage		V_{GS}	±30		V
Continuous Drain Current	T_C = 25 ℃	I_D	8	8*	A
	T_C = 100 ℃		4.9	4.9 *	A
Pulsed Drain Current (Note 1)		I_{DM}	32	32*	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	201		mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	8		A
Repetitive Avalanche Energy (Note 1)		E_{AR}	25		mJ
Power Dissipation	T_C = 25 ℃	P_D	250	40.3	W
	Derate above 25 ℃		2	0.32	W/℃
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		℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300		℃

* Limited by maximum junction temperature

Parameter	Symbol	Rating		Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	0.5	3.1	℃/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	℃/W

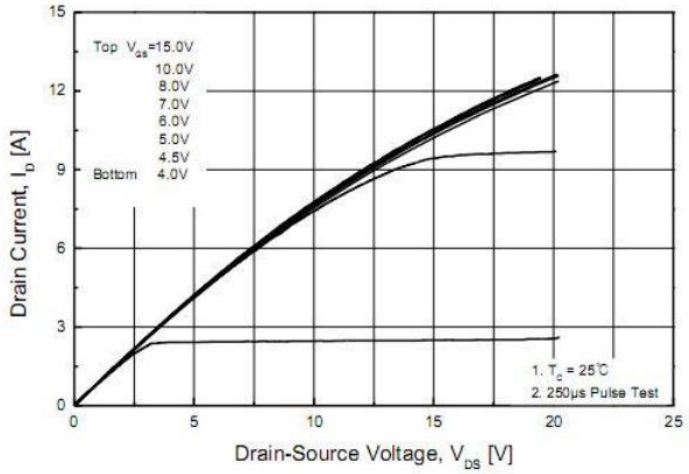
* Note: Surface mounted on FR4 board t ≦ 10sec

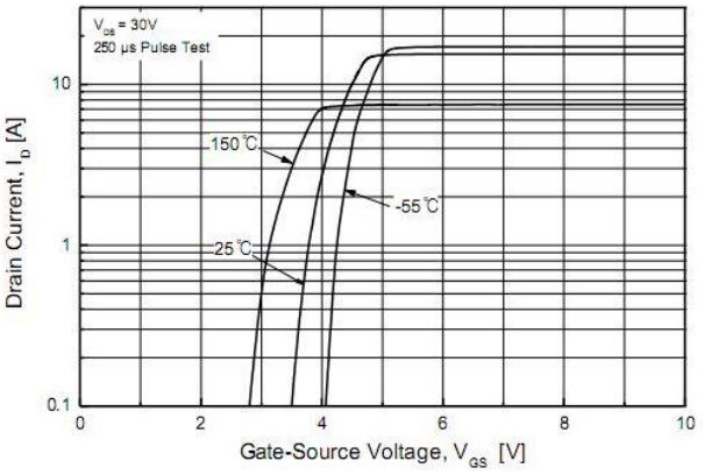
Electrical Characteristics (Tc=25°C)

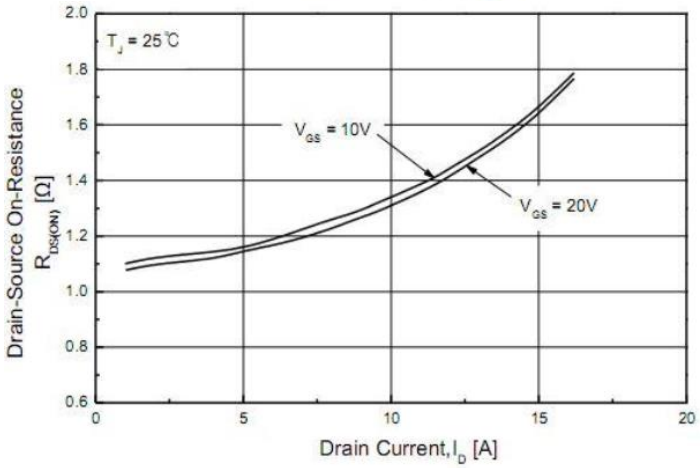
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 800 V, V_{GS} = 0 V	--	--	10	µA
		V_{DS} = 640 V, T_C = 125°C	--	--	100	µA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 2 A	--	1.1	1.4	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 2 A	--	7	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	1921	--	pF
Output Capacitance	C_{oss}		--	146	--	pF
Reverse Transfer Capacitance	C_{rss}		--	12	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 400 V, I_D = 8 A, R_G = 25 Ω	--	31	--	ns
Turn-On Rise Time (Note 4,5)	t_r		--	30	--	ns
Turn-Off Delay Time (Note 4,5)	$t_{d(off)}$		--	172	--	ns
Turn-Off Fall Time (Note 4,5)	t_f		--	37	--	ns
Total Gate Charge (Note 4,5)	Q_g	V_{DS} = 640V, I_D = 8 A, V_{GS} = 10 V	--	46	--	nC
Gate-Source Charge (Note 4,5)	Q_{gs}		--	7	--	nC
Gate-Drain Charge (Note 4,5)	Q_{gd}		--	15	--	nC
SOURCE DRAIN DIODE						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	8	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	32	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 8 A	--	--	1.5	V
Reverse Recovery Time (Note 4)	t_{rr}	V_{GS} = 0 V, I_S = 8 A, dI_F / dt = 100 A/µs	--	479	--	ns
Reverse Recovery Charge (Note 4)	Q_{rr}		--	5.5	--	µC

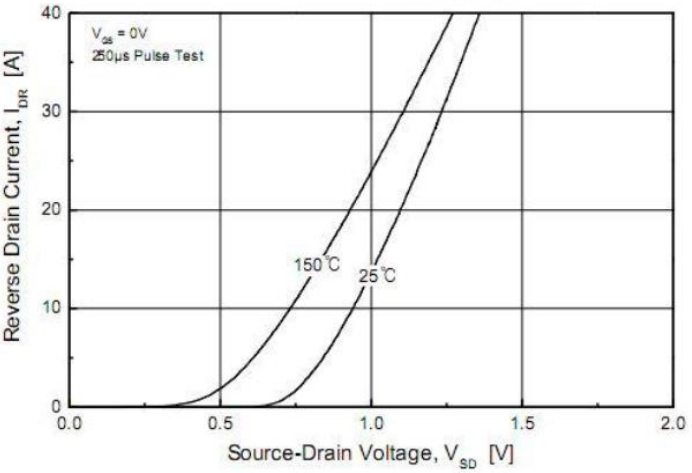
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L= 8.9mH, I_{AS} = 8A, V_{DD} = 50V, R_G = 25Ω, Starting T_J= 25 ℃
3. I_{SD} ≤ 8A, di/dt ≤ 200A/µs , V_{DD} ≤ BV_{DS}, Starting T_J= 25 ℃
4. Pulse Test :Pulse width ≤ 300µs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

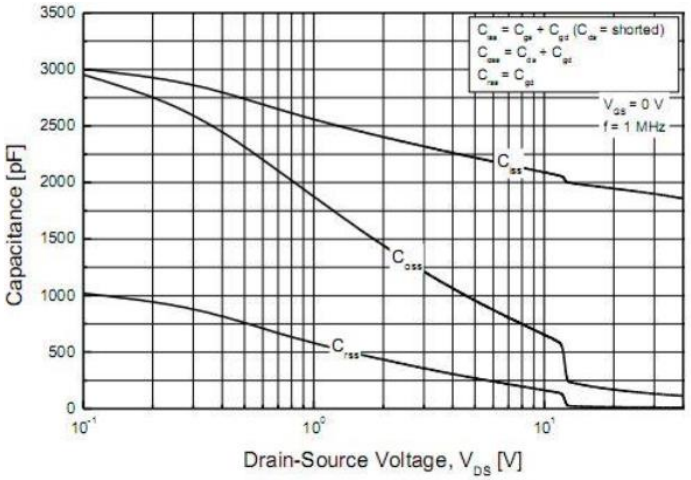
Electrical Characteristic Curves

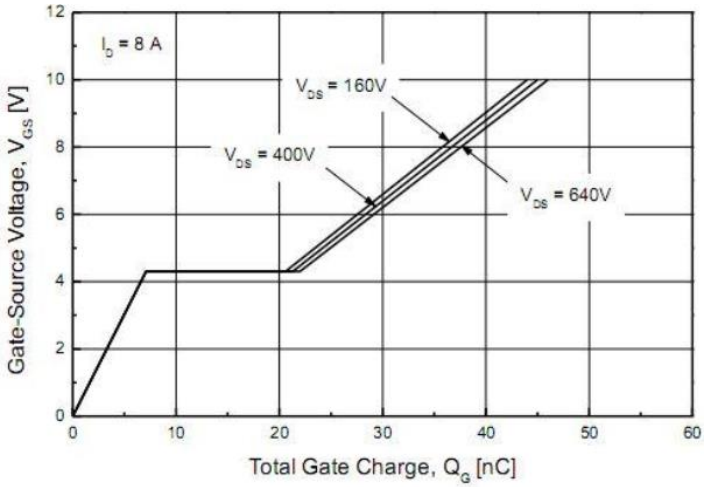


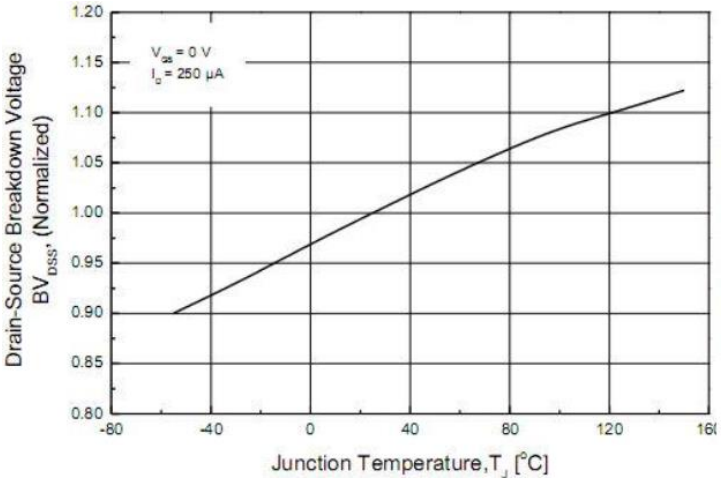


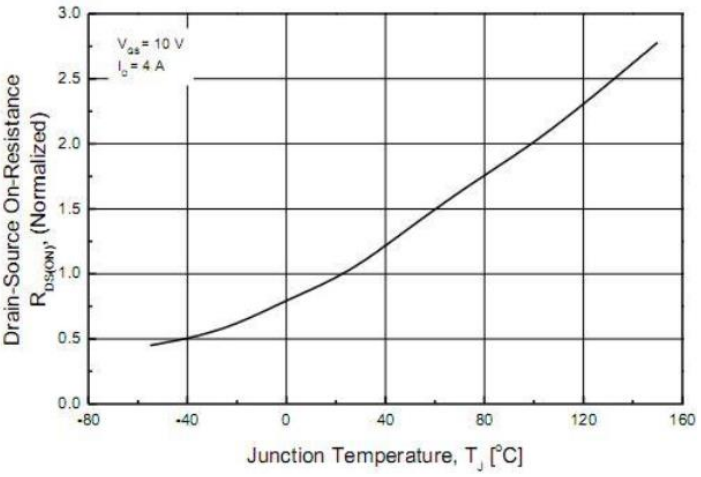


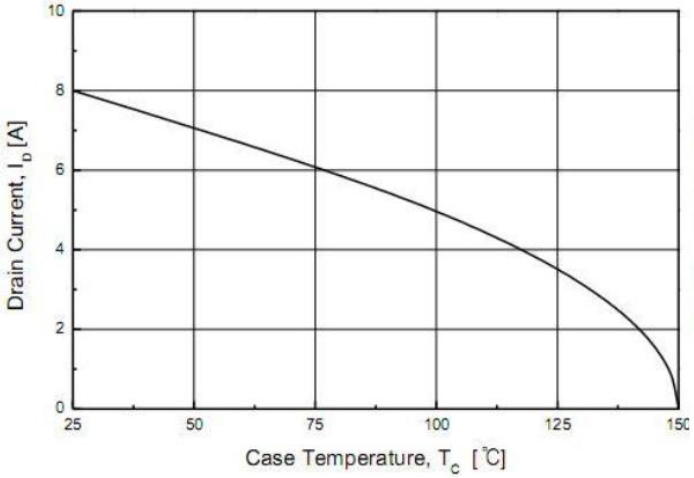


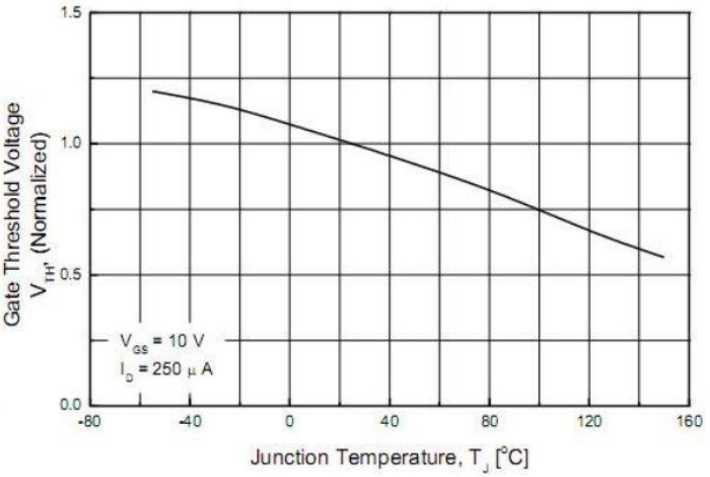


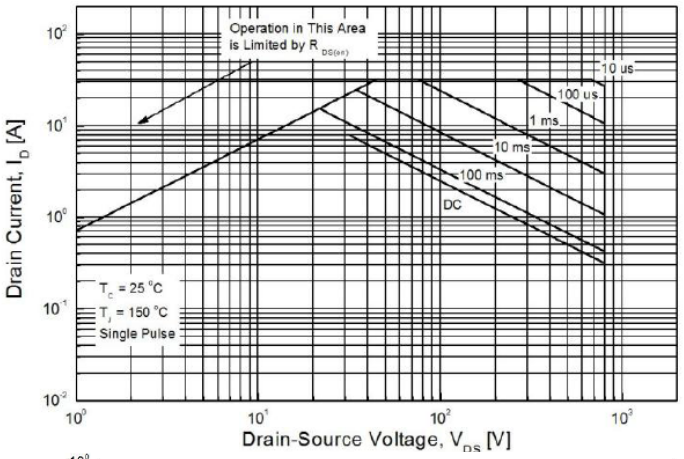


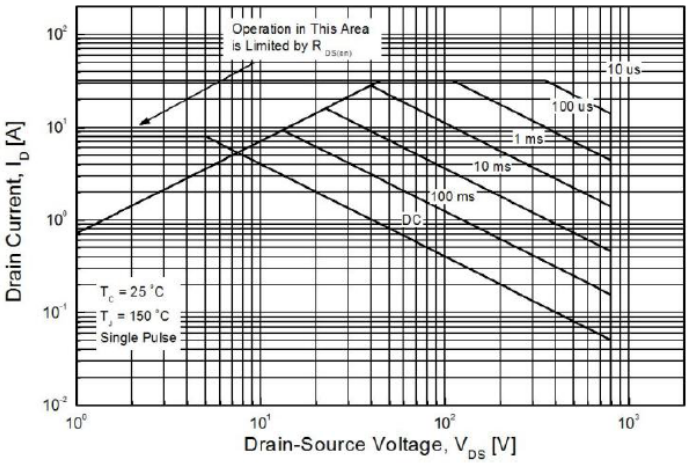

Drain-Source Breakdown Voltage
BV_DSS, (Normalized)
V_GS = 0 V
I_D = 250 μA
Junction Temperature,T_J [°C]

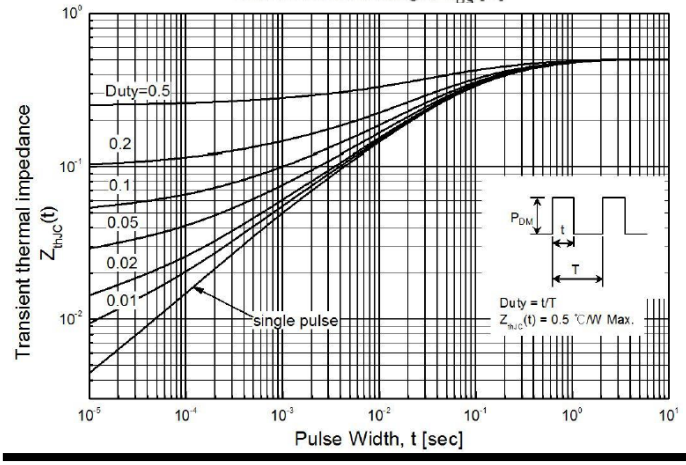

Drain-Source On-Resistance
R_DS(ON), (Normalized)
V_GS = 10 V
I_D = 4 A
Junction Temperature, T_J [°C]

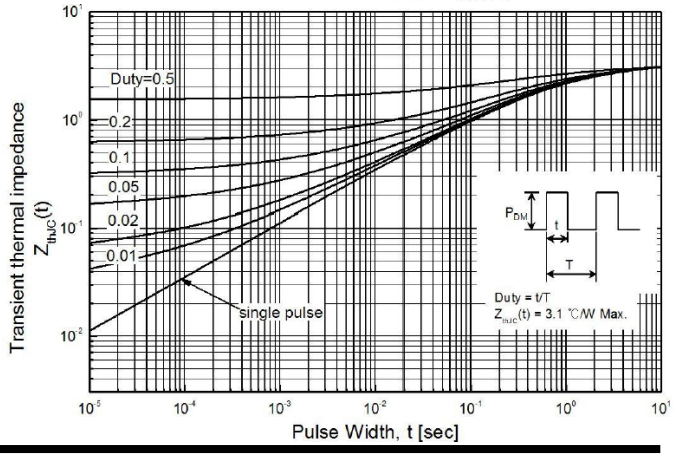

Drain Current, I_D [A]
Case Temperature, T_C [°C]


Gate Threshold Voltage
V_TH, (Normalized)
V_GS = 10 V
I_D = 250 μA
Junction Temperature, T_J [°C]

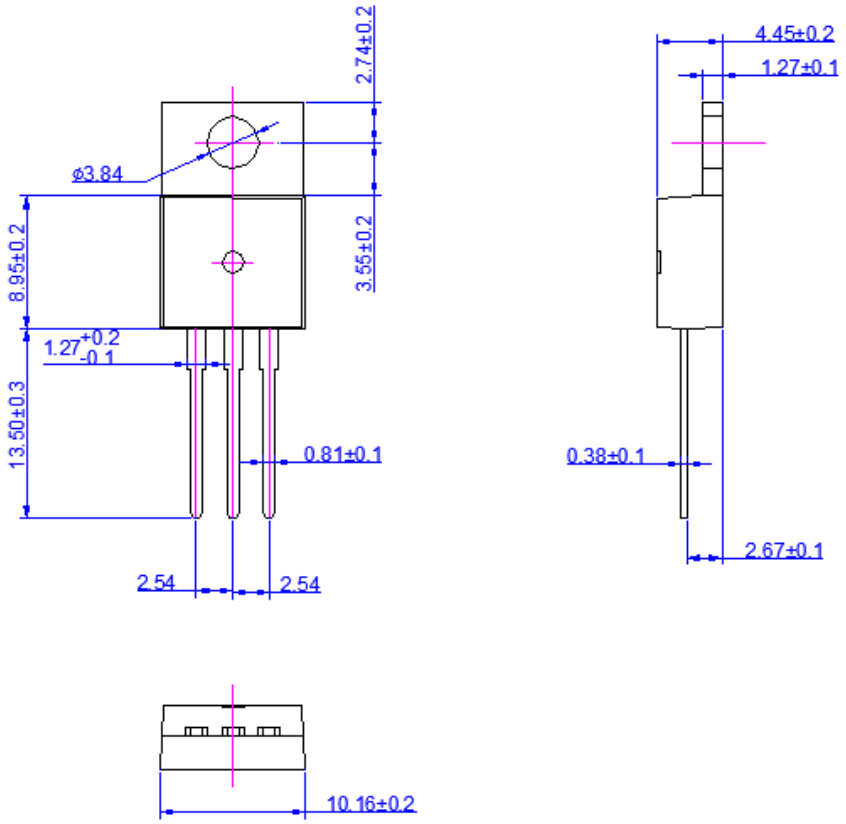

Operation in This Area
is Limited by R DS(on)
10 us
100 us
1 ms
10 ms
100 ms
DC
T_C = 25 °C
T_J = 150 °C
Single Pulse
Drain Current, I_D [A]
Drain-Source Voltage, V_DS [V]


Operation in This Area
is Limited by R DS(on)
10 us
100 us
1 ms
10 ms
100 ms
DC
T_C = 25 °C
T_J = 150 °C
Single Pulse
Drain Current, I_D [A]
Drain-Source Voltage, V_DS [V]

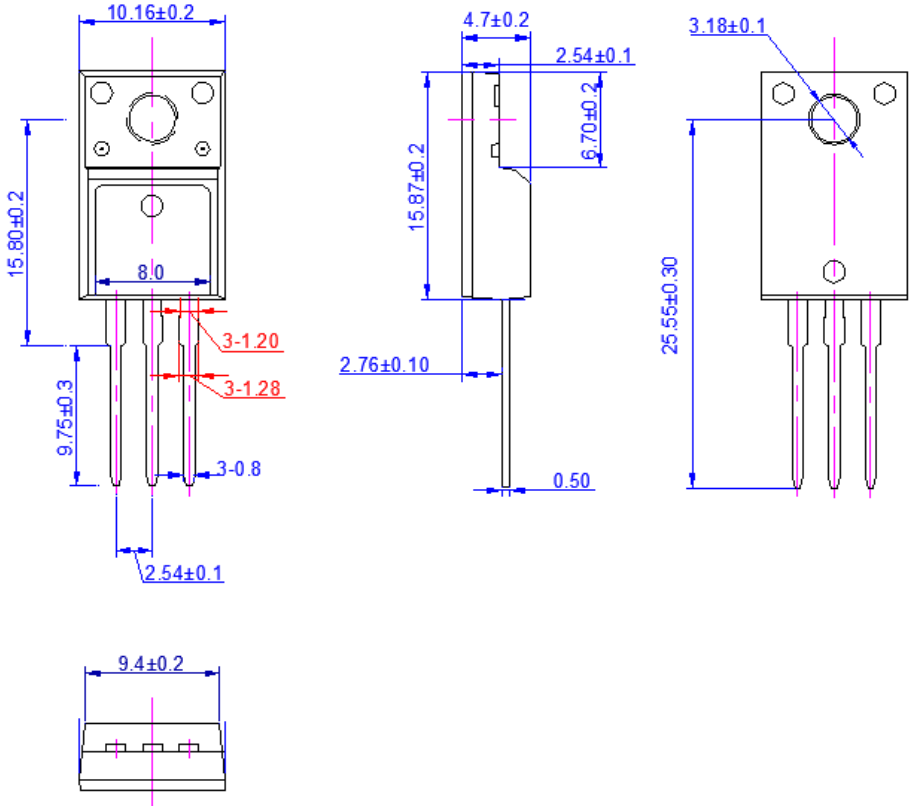

Duty=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
P_DM
t
T
Duty = t/T
Z_thJC(t) = 0.5 °C/W Max.
Transient thermal impedance
Z_thJC(t)
Pulse Width, t [sec]


Duty=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
P_DM
t
T
Duty = t/T
Z_thJC(t) = 3.1 °C/W Max.
Transient thermal impedance
Z_thJC(t)
Pulse Width, t [sec]

Outline Dimension : TO-220

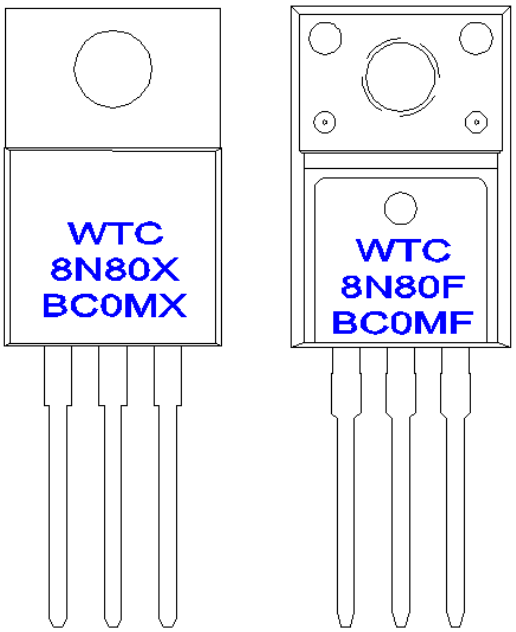


Outline Dimension : TO-220F



Unit : mm

Marking Diagram



First Line	WTC	Company Name	
Second Line	8N80X 8N80F	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-Transsistor
		5th (Package Code)	D-TO-252, I-TO-251, X-TO-220, F-TO-220F
		6th (Spec Code)	(Reserve)