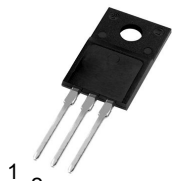
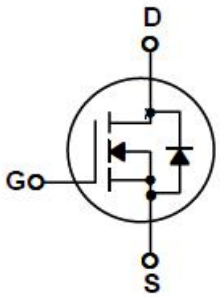
Features

- 16A, 670V, RDS(on) =410 mΩ @VGS = 10 V
- Low gate charge (typical 35nC)
- Low Crss (typical 5.5pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

TO-220F Package



1. Gate 2. Drain 3. Source



General Description

This Power MOSFET is produced by WPM using its own advanced planar stripe DMOS technology. This advanced technology has been especially tailored to minimize
on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

Making:
WPM 16N65VF XXX YYWW

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	670	V
I_D	Drain Current - Continuous (TC= 25°C)	16	A
	- Continuous (TC= 100°C)	10.0*	A
I_{DM}	Drain Current - Pulsed (Note 1)	64*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	390	mJ
I_{AR}	Avalanche Current (Note 1)	16	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	51	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5	V/ns
P_D	Power Dissipation (TC = 25°C)	38.0	W
	- Derate above 25°C	0.30	W/°C
T_j , T_{stg}	Operating and Storage Temperature Range	-55 to +150	°C
T_L	Maximum lead temperature for soldering purposes,1/8" from case for 5 seconds	300	°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.70	°C/W
$R_{\theta JS}$	Thermal Resistance, Case-to-Sink Typ.	--	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	42.8	°C/W

WPMtek

Electrical Characteristics TC = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	670			V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25°C		0.61		V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 670 V, V_{GS} = 0 V			1	μA
		V_{DS} = 400 V, TC = 125°C			10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V			-100	nA
On Characteristics						
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D =250 uA	3.0		5.0	V
$R_{DS(On)}$	Drain-Source On-state Resistance	V_{GS}=10 V, I_D =8 A, T_J = 25°C		410	510	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 40 V, I_D = 8 A (Note 4)		16		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz		1830		pF
C_{oss}	Output Capacitance			245		pF
C_{rss}	Reverse Transfer Capacitance			5.5		pF
Switching Characteristics						
$t_{d(on)}$	Turn On Delay Time	V_{DD} = 335 V, ID = 16 A, R_G = 25 Ω (Note 4, 5)		30		ns
t_r	Rising Time			45		ns
$t_{d(off)}$	Turn Off Delay Time			78		ns
t_f	Fall Time			42		ns
Q_g	Total Gate Charge	V_{DS} = 335 V, ID = 16 A, V_{GS} = 10 V (Note 4, 5)		35		nC
Q_{gs}	Gate-Source Charge			11		nC
Q_{gd}	Gate-Drain Charge			11.8		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				16	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				64	A
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 16 A			1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_S = 16 A, dI_F / dt = 100 A/μs Note 4)		450		ns
Q_{rr}	Reverse Recovery Charge			5.4		μC

Notes:
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L =2.2 mH, IAS = 16A, VDD = 50V, RG = 25Ω, Starting TJ = 25°C
3. ISD≤20A, di/dt ≤200A/us, VDD ≤ BVDSS, Starting TJ = 25°C
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

WPMtek

Typical Characteristics

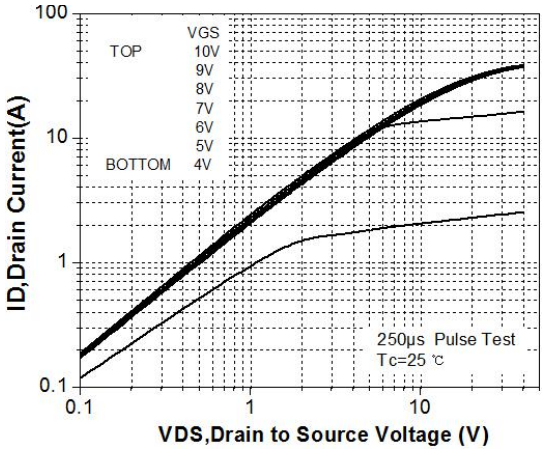


Figure 1. On-Region Characteristics

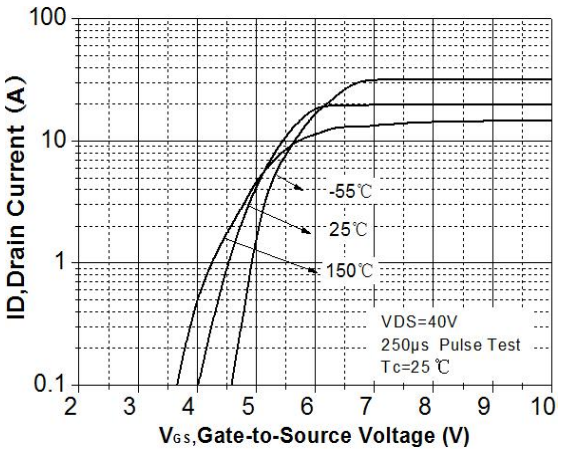


Figure 2. Transfer Characteristics

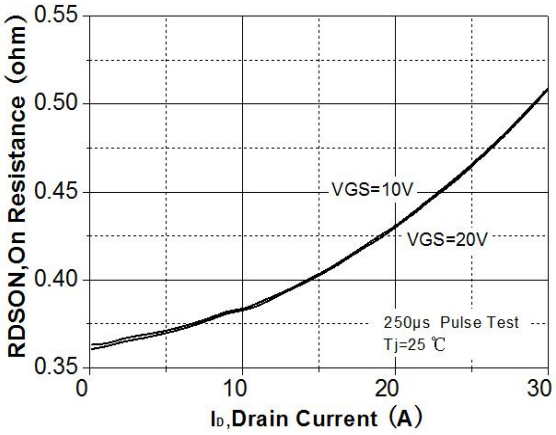


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

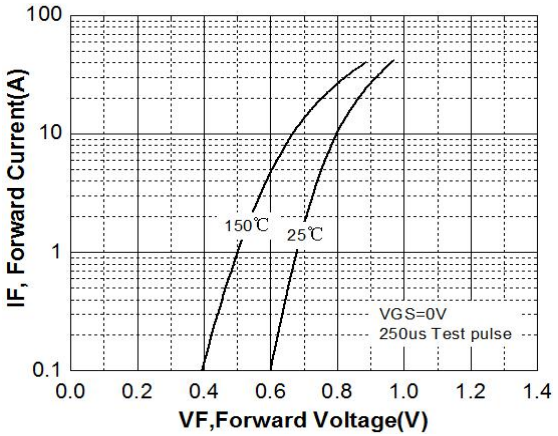


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

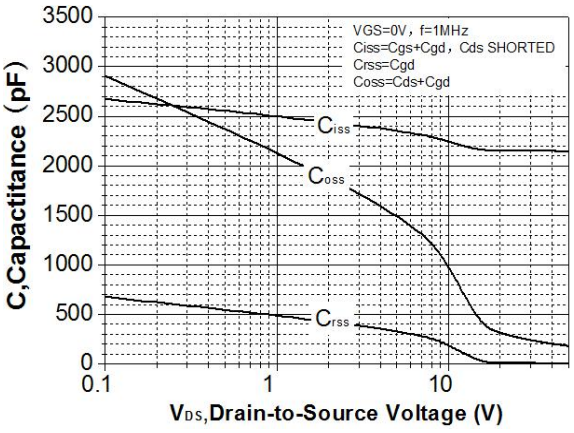


Figure 5. Capacitance Characteristics

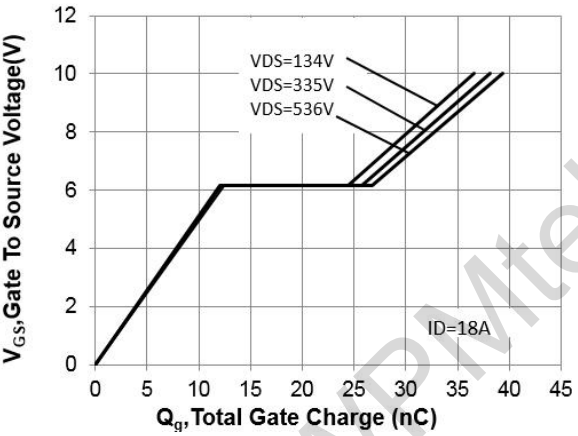


Figure 6. Gate Charge Characteristics

WPMtek

Typical Characteristics (Continued)

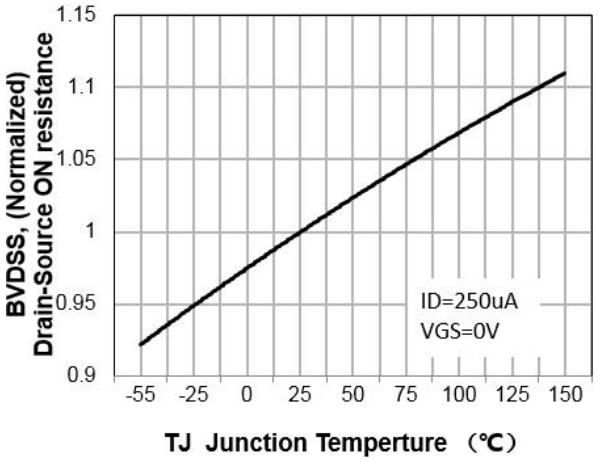


Figure 7. Breakdown Voltage Variation vs Temperature

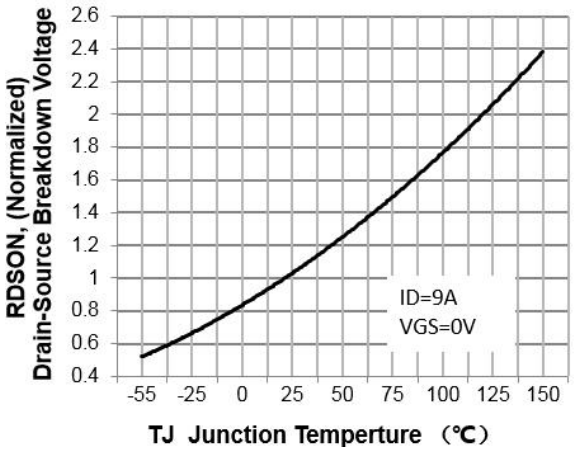


Figure 8. On-Resistance Variation vs Temperature

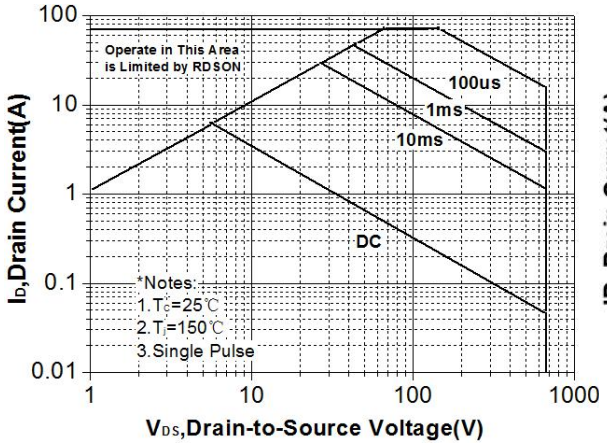


Figure 9. Maximum Safe Operating Area

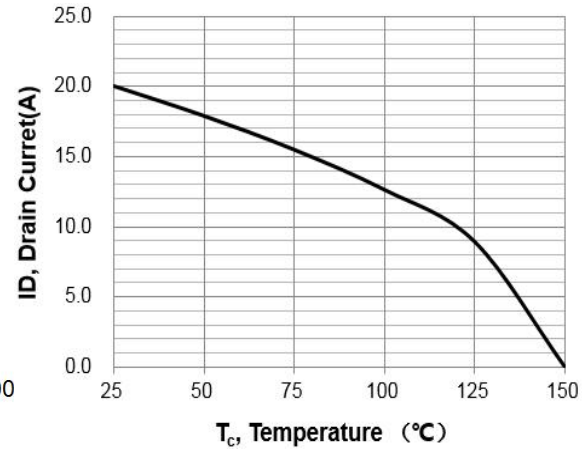


Figure 10. Maximum Drain Current vs Case Temperature

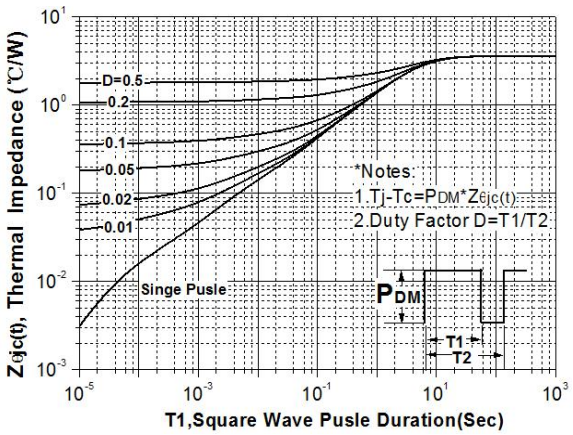
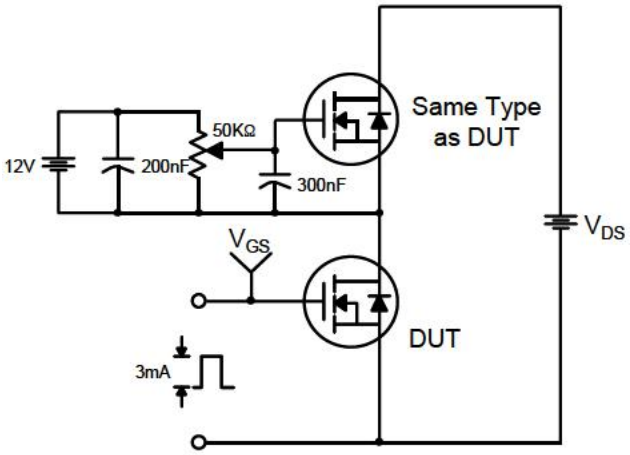
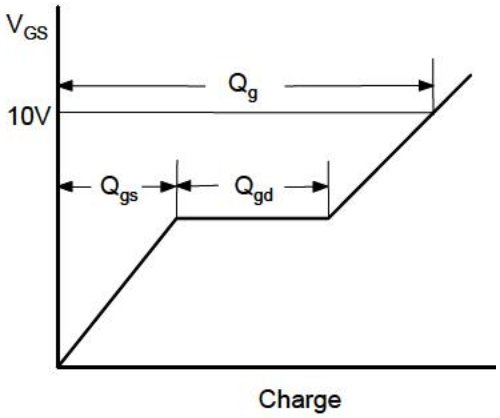


Figure 11. Transient Thermal Response Curve

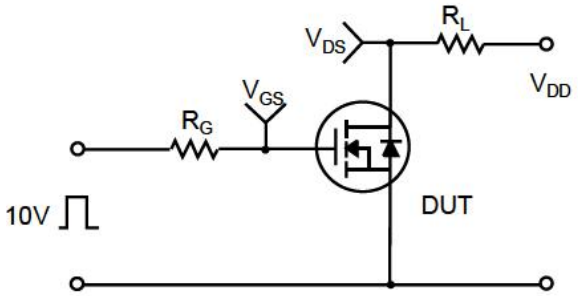
WPMtek

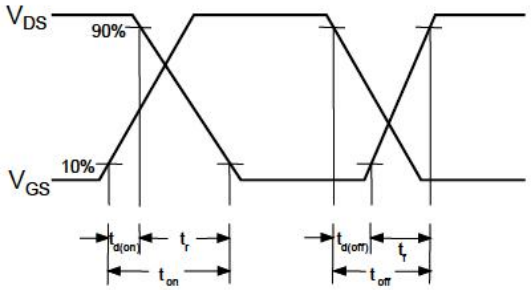
Gate Charge Test Circuit & Waveform



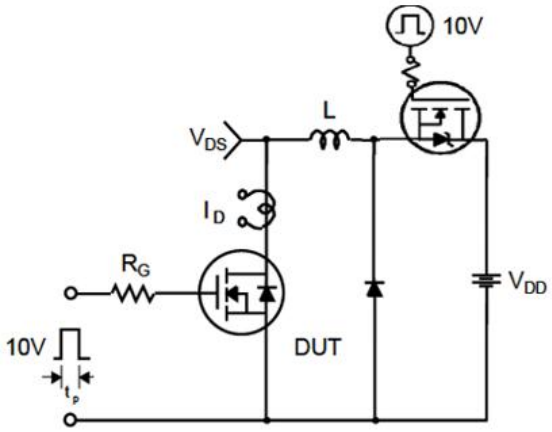


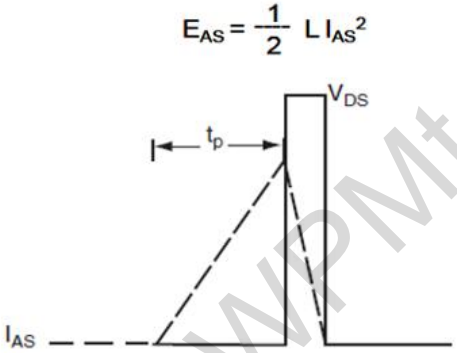
Resistive Switching Test Circuit & Waveforms





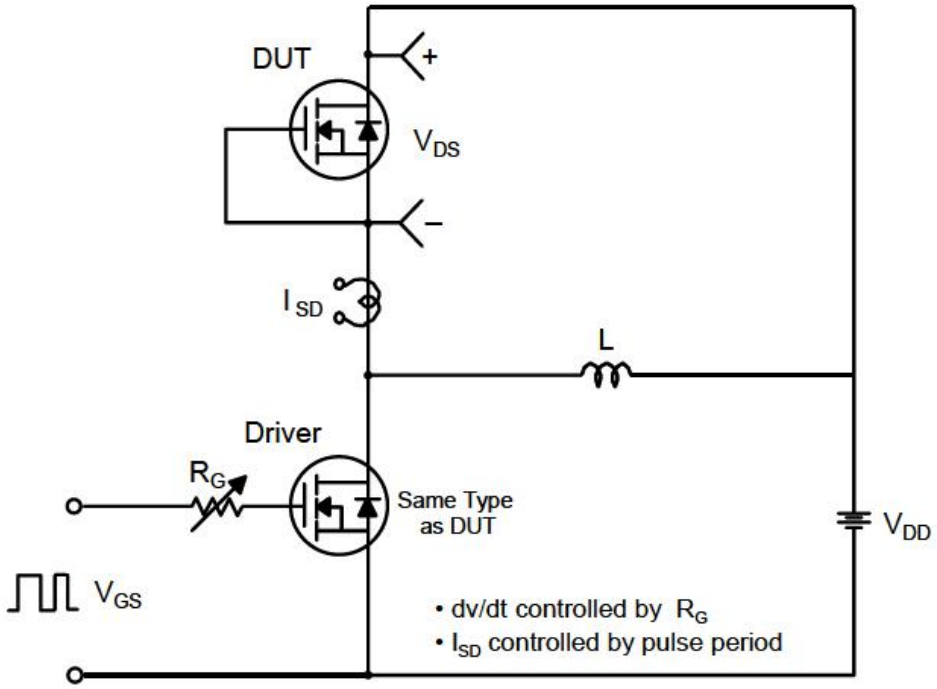
Unclamped Inductive Switching Test Circuit & Waveforms

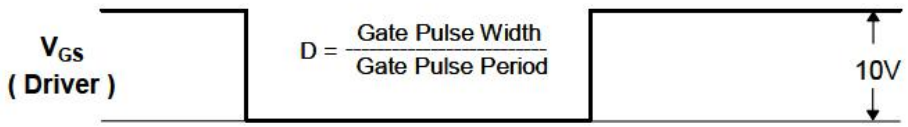


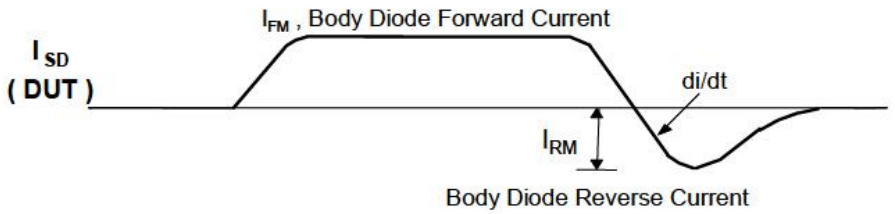


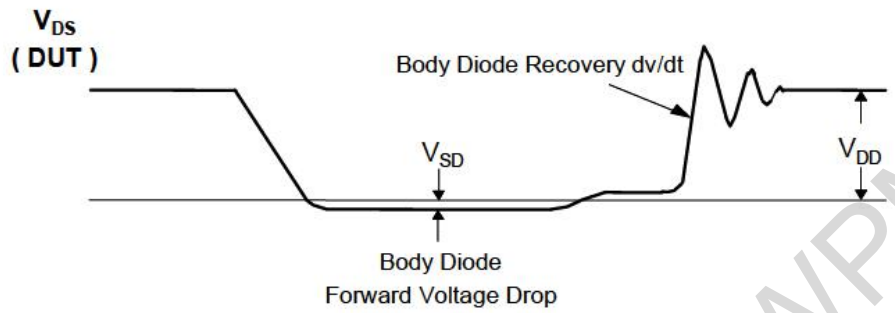
WPMtek

Peak Diode Recovery dv/dt Test Circuit & Waveforms





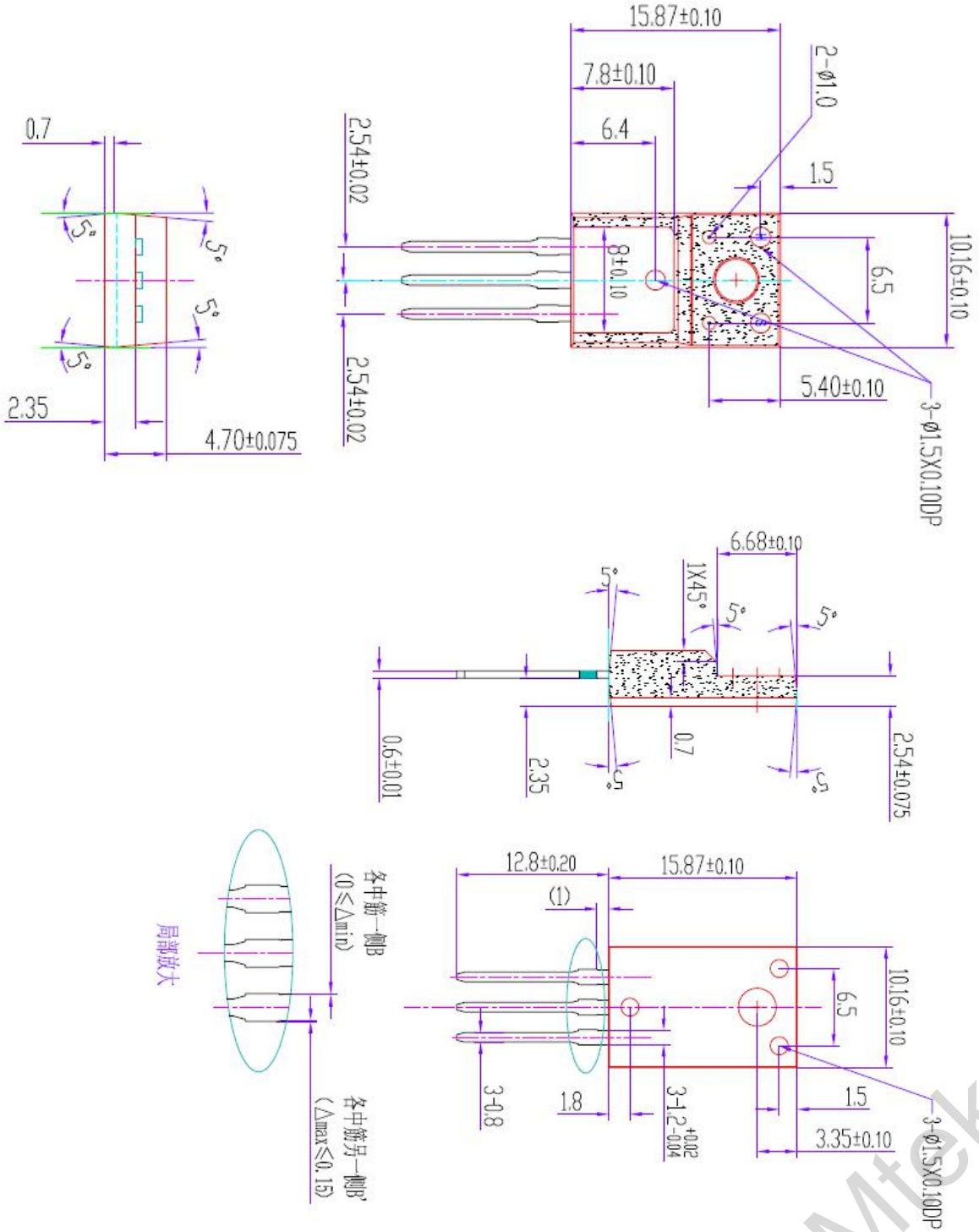




WPMtek

Package Dimensions

TO220F



WPMtek reserves the right to make changes to the product specification and data in this document without notice. WPMtek makes no warranty, representation or guarantee regarding the suitability of its products for any particu lar purpose, nor does WPMtek assume any liability arising from the application or use of any products or circuits, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Any enquiry ,please write to sales@wpmtek.com for futher information.