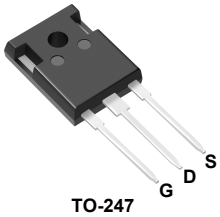
WTM30N65FMP/FF

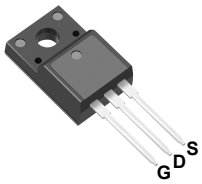
650V N-Channel Multi-EPI Super-Junction MOSFET

Features

- 650V@T_j=150℃
- 30A,650V, $R_{DS(on)typ}$ =121mΩ@V_{GS} = 10 V
- Low gate charge(typ. Qg =46nC)
- High ruggedness
- Ultra fast switching
- 100% avalanche tested
- Improved dv/dt capability



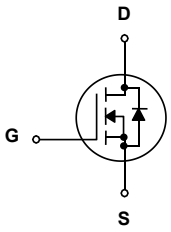
TO-247



TO-220F

General Description

This Power MOSFET is produced using WPMtek's advanced Super-Junction MOSFET 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.



Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	WTM30N65FMP/FF	Units
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current * - Continuous (T_C = 25℃)	30	A
	- Continuous (T_C = 100℃)	15	A
I_{DM}	Drain Current * - Pulsed (Note 1)	72	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	455	mJ
P_D	Power Dissipation (T_C = 25℃) TO-247	265	W
	Power Dissipation (T_C = 25℃) TO-220F	39	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	℃

* Drain current limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	WTM30N65FMP/FF	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.65	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	℃/W

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Electrical Characteristics

T_C = 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 uA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	--	--	10	uA
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	2.5	--	4.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 12A	--	121	137	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =100 V, V_{GS} = 0 V, f = 100KHz	--	2072	--	pF
C_{oss}	Output Capacitance		--	101	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.3	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 400V, I_D = 12A, R_G = 4.7Ω, V_{GS} = 10V (Note3)	--	21	--	ns
t_r	Turn-On Rise Time		--	40	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	56	--	ns
t_f	Turn-Off Fall Time		--	14	--	ns
Q_g	Total Gate Charge	V_{DS} =400V, I_D = 12A, V_{GS} =10V (Note3)	--	46	--	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		--	15	--	nC
R_G	Gate Resistance	f =1MHz	--	1.9	--	Ω

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	30	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	72	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 30A	--	--	1.4	V
t_{rr}	Reverse Recovery Time	V_{DS} =400 V, I_S = 12A, dI_F / dt = 130A/us	--	110	--	ns
Q_{rr}	Reverse Recovery Charge		--	0.79	--	uC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J =25°C, V_{DD} =50V, V_G =10V, L=10mH,
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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Typical Characteristics

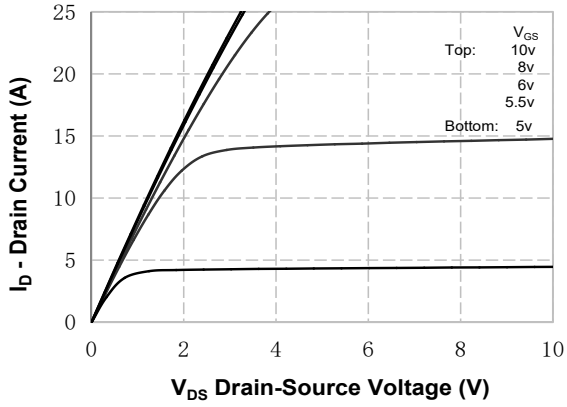


Figure 1. On-Region Characteristics

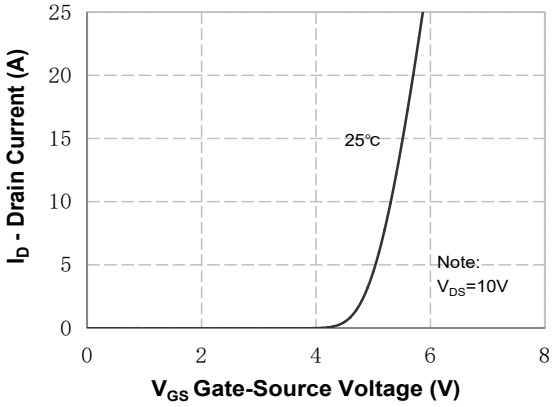


Figure 2. Transfer Characteristics

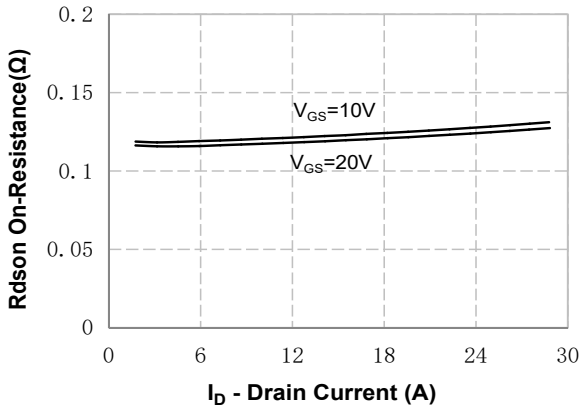


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

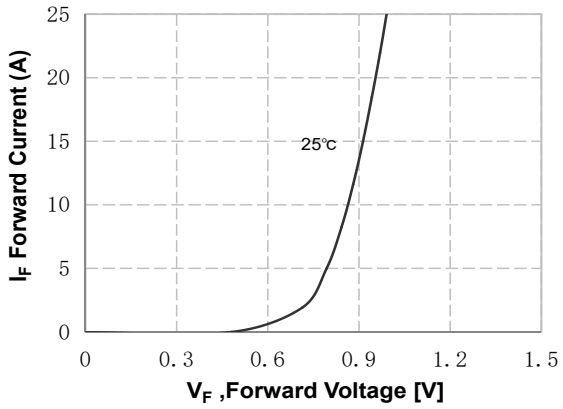


Figure 4. Body Diode Forward Voltage Variation with Source Current

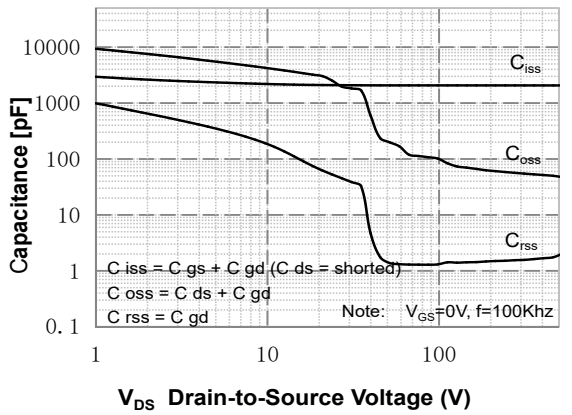


Figure 5. Capacitance Characteristics

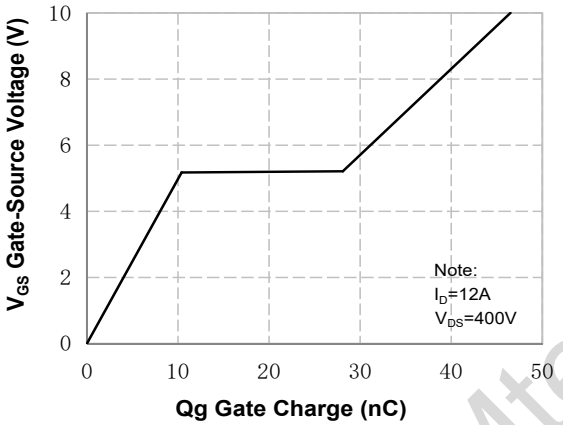


Figure 6. Gate Charge Characteristics

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Typical Characteristics (Continued)

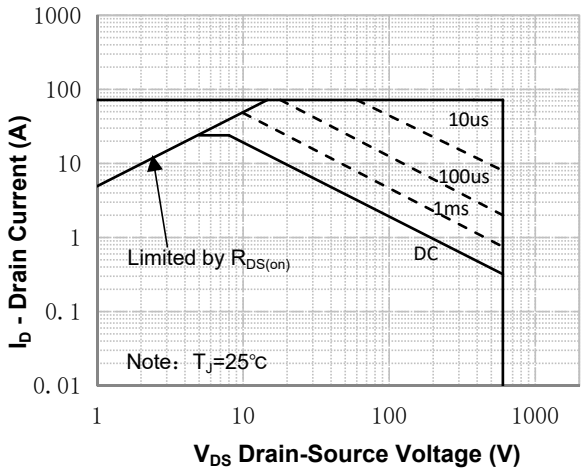


Figure 7. Maximum Safe Operating Area

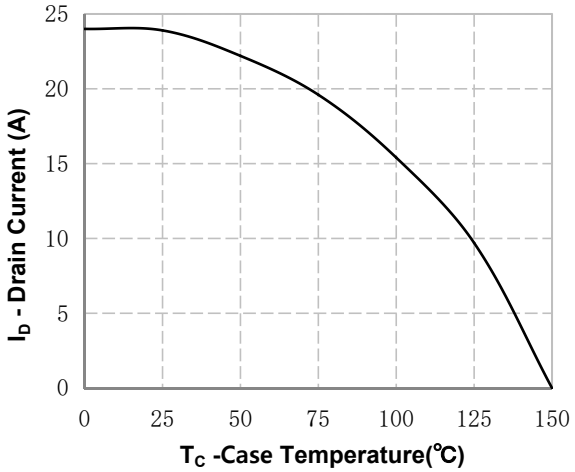


Figure 8. Maximum Drain Current vs Case Temperature

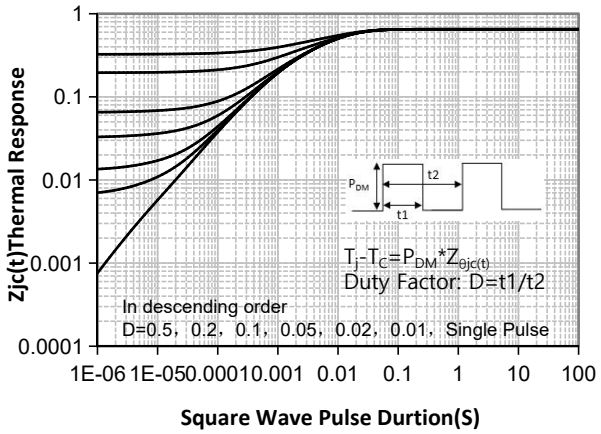
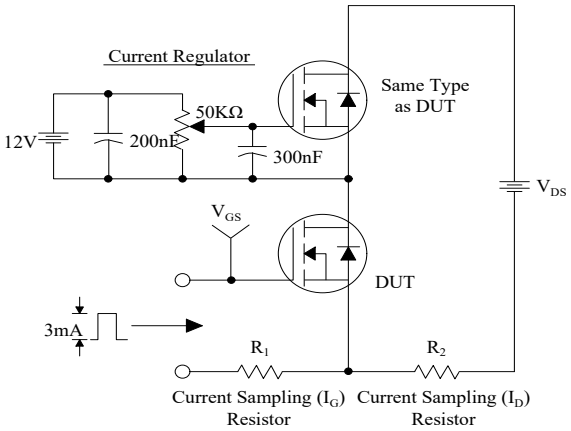
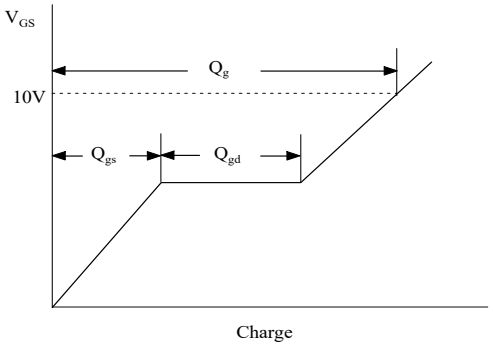


Figure 9. Transient Thermal Response Curve

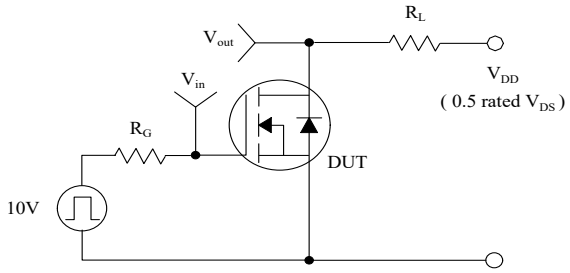
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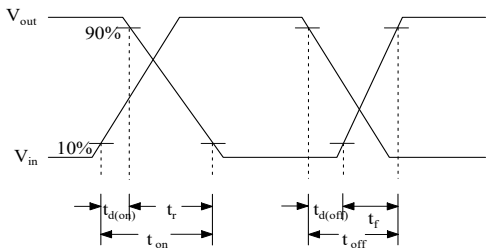
Gate Charge Test Circuit & Waveform



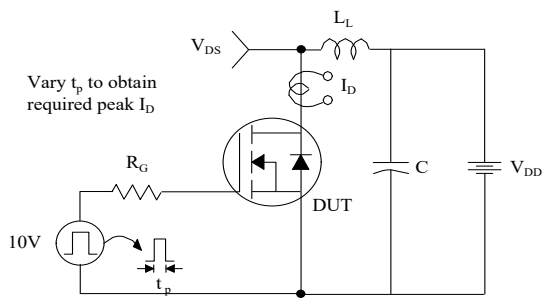


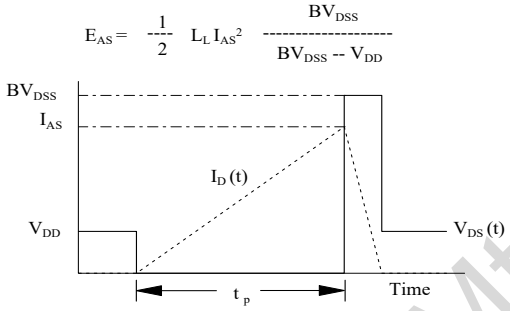
Resistive Switching Test Circuit & Waveforms





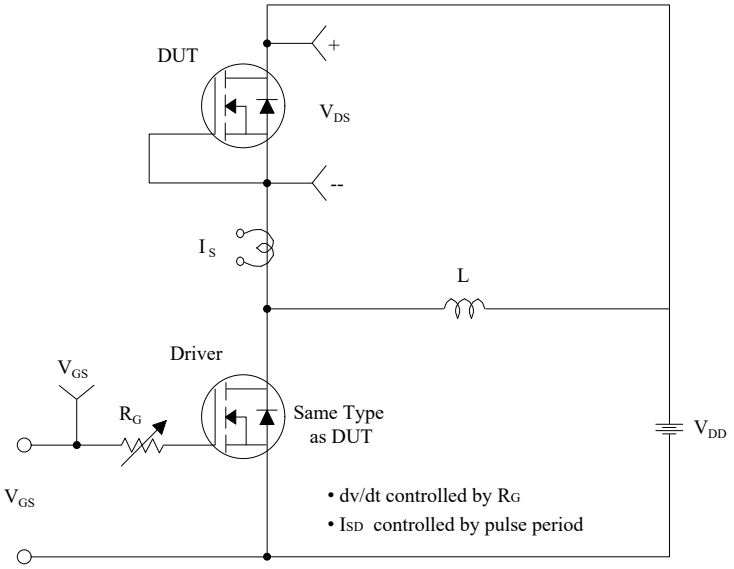
Unclamped Inductive Switching Test Circuit & Waveforms

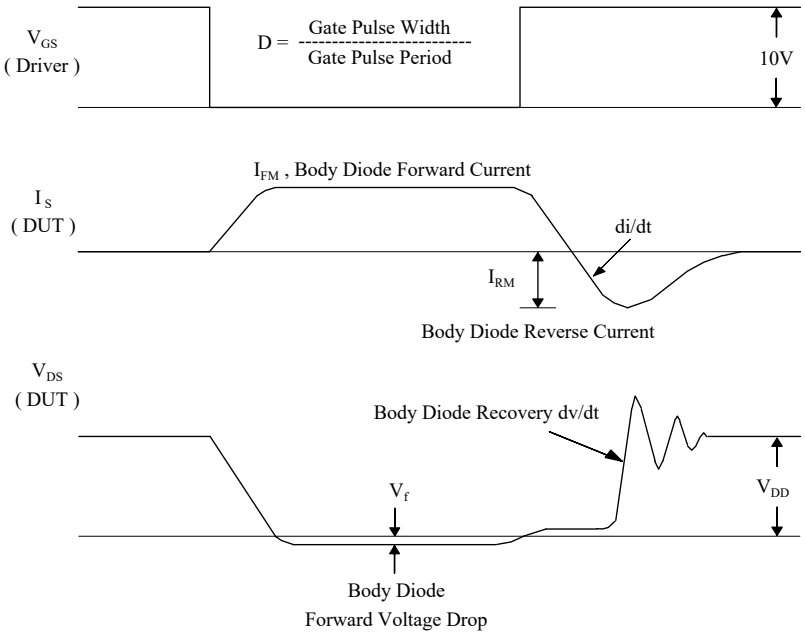




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Peak Diode Recovery dv/dt Test Circuit & Waveforms

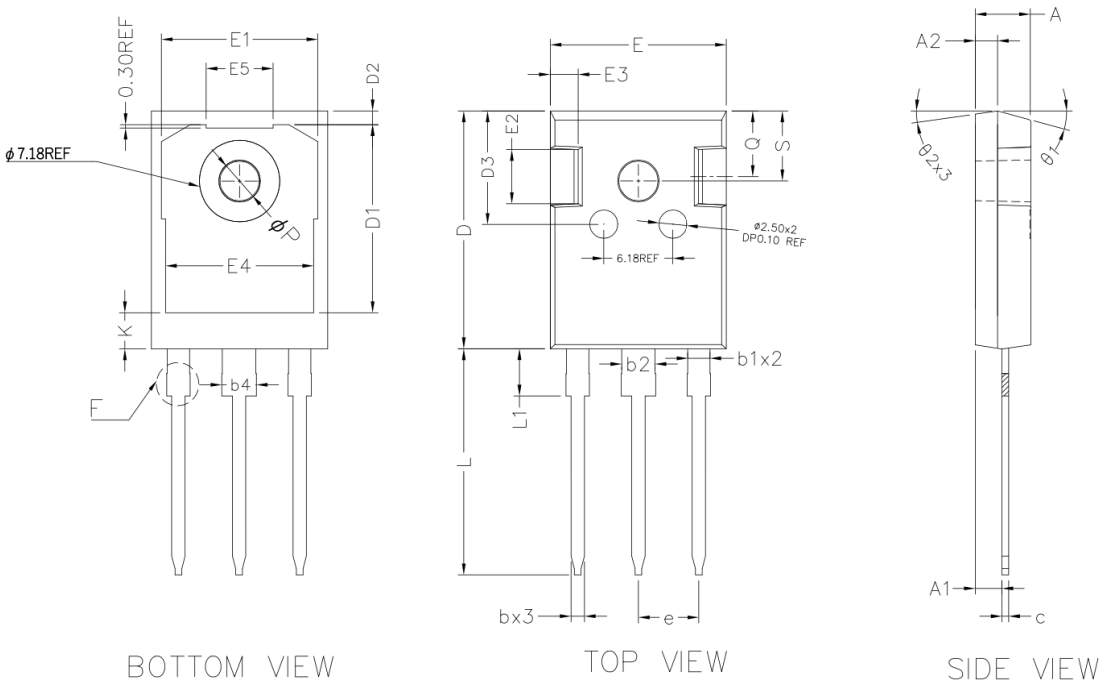




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Package Outline

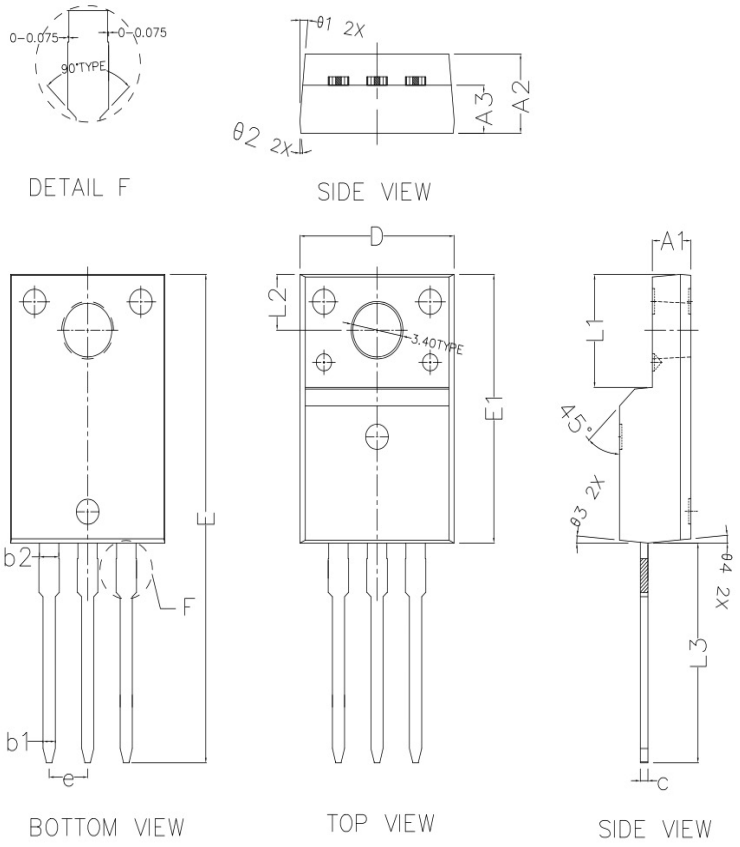
TO-247 Outline



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	4.900	5.000	5.100
A1	2.300	2.400	2.500
A2	1.900	2.000	2.100
b	1.070	1.200	1.330
b1	1.910	2.000	2.160
b2	2.870	3.000	3.160
b3	1.910	2.100	2.410
b4	2.870	3.000	3.380
c	0.550	0.600	0.680
D	20.000	21.000	21.100
D1	16.250	16.950	17.650
D2		1.200REF	
D3		10.000REF	
E	15.700	15.800	15.900
E1	13.100	14.020	14.150
E2	3.680	–	5.100
E3	1.000	–	1.900
E4	12.380	13.260	13.430
E5		5.990REF	
e		5.440BSC	
L	19.810	19.950	20.320
L1	4.100	–	4.400
ϕP	3.500	–	3.650
Q	5.490	–	6.000
S	6.040	–	6.300
θ1		15.0°REF	
θ2		8.0°REF	
θ3		8.0°REF	
K		3.190REF	

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TO-220F Outline

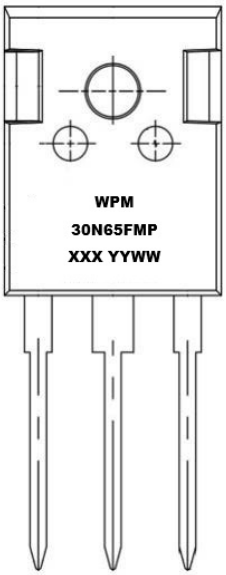


COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	2.440	2.540	2.640
A2	4.600	4.700	4.800
A3	2.730	2.830	2.930
b1	0.750	0.800	0.850
b2	1.230	1.280	1.330
c	0.450	0.500	0.550
D	10.060	10.160	10.260
E	28.650	28.850	29.050
E1	15.770	15.870	15.970
e	2.54TYPE		
L1	6.68REF		
L2	3.30REF		
⚠L3	12.830	12.980	13.130
θ1	5° TYPE		
θ2	5° TYPE		
θ3	5° TYPE		
θ4	5° TYPE		

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Marking Information

TO-247



TO-220F



WPM=WPMtek's Logo
30N65FF=Marking
XXX YYWW=Date Code

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