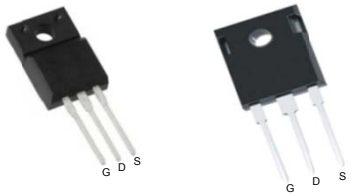
950V 0.135Ω Super Junction Power MOSFET

Description

WMOS™ C2P is Wayon's new generation super junction MOSFET family that is utilizing charge balance technology for extremely low on-resistance and low gate charge performance. WMOS™ C2P is suitable for applications which require superior power density and outstanding efficiency.

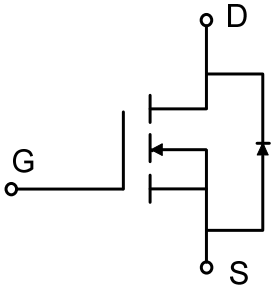


TO-220F TO-247

Features

- V_{DS} =1000V @ $T_{j,max}$
- Typ. $R_{DS(on)}$ =0.135Ω
- 100% UIS tested
- Pb-free plating, Halogen free

RoHS compliant



Applications

LED Lighting, Charger, Adapter, PC, LCD TV, Server

Absolute Maximum Ratings

Parameter	Symbol	WMJ	WML	Unit
Drain-source voltage	V_{DSS}	950		V
Continuous drain current[1] (T_C = 25°C)	I_D	33		A
(T_C = 100°C)		19		A
Pulsed drain current[2]	I_{DM}	120		A
Gate-source voltage	V_{GS}	±30		V
Avalanche energy, single pulse[3]	E_{AS}	360		mJ
Avalanche energy, repetitive[2]	E_{AR}	0.25		mJ
Avalanche current, repetitive[2]	I_{AR}	5		A
Power dissipation (T_C = 25°C)	P_D	416	35	W
- Derate above 25°C		3.4	0.28	W/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150		°C
Continuous diode forward current[1]	I_S	33		A
Diode pulse current[2]	$I_{S,pulse}$	120		A

Thermal Characteristics

Parameter	Symbol	WMJ	WML	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	0.3	3.5	°C/W
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	62	80	°C/W

Electrical Characteristics T_c = 25°C, unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=1 mA	950	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=0.25mA	3	4	5	V
Drain cut-off current	I_{DSS}	V_{DS}=950 V, V_{GS}=0 V, T_j = 25°C T_j = 125°C	 - -	 - 200	 20 -	μA
Gate leakage current, forward	I_{GSSF}	V_{GS}=20 V, V_{DS}=0 V	-	-	100	nA
Gate leakage current, reverse	I_{GSSR}	V_{GS}=-20 V, V_{DS}=0 V	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=10A T_j = 25°C	- -	 0.135	 0.158	 Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}= 100 V, V_{GS}= 0 V,	-	3350	-	pF
Output capacitance	C_{oss}	f = 1 MHz	-	93	-	
Reverse transfer capacitance	C_{rss}		-	5.5	-	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 300V, I_D = 20A	-	57	-	ns
Rise time	t_r	R_G = 25Ω, V_{GS}=10V	-	83	-	
Turn-off delay time	$t_{d(off)}$		-	293	-	
Fall time	t_f		-	56	-	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DD}=480 V, I_D=20A,	-	21	-	nC
Gate to drain charge	Q_{gd}	V_{GS}=0 to 10 V	-	36	-	
Gate charge total	Q_g		-	87	-	
Gate plateau voltage	$V_{plateau}$		-	5.7	-	V
Reverse diode characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=10A	-	-	1.2	V
Reverse recovery time	t_{rr}	V_R=50 V, I_F=20A,	-	197	-	ns
Reverse recovery charge	Q_{rr}	dI_F/dt=100 A/μs	-	1.5	-	μC
Peak reverse recovery current	I_{rrm}		-	15	-	A

Notes:

1. Limited by $T_{j\,max}$. Maximum duty cycle D=0.5.

2. Repetitive rating: pulse width limited by maximum junction temperature

3. I_{AS} = 5A, V_{DD} = 50V, R_G = 25Ω, starting T_j = 25°C

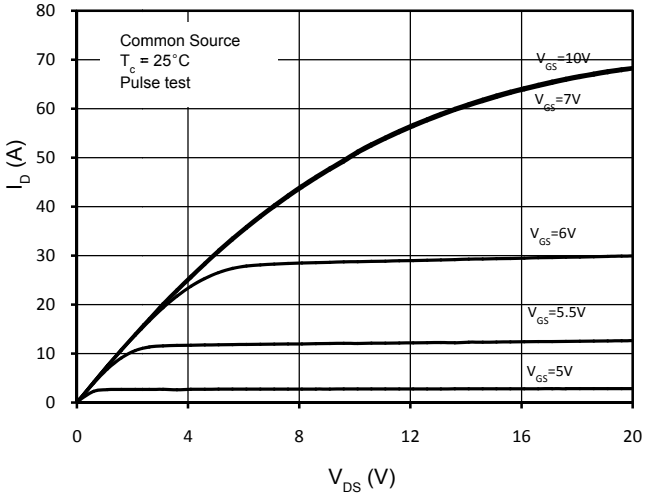


Figure 1.On-Region Characteristics

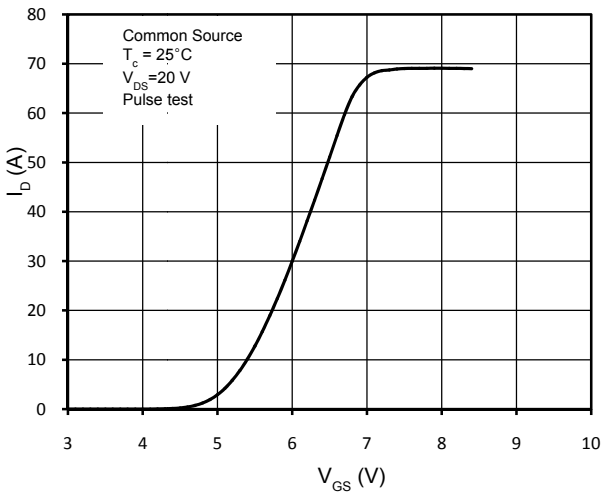


Figure 2. Transfer Characteristics

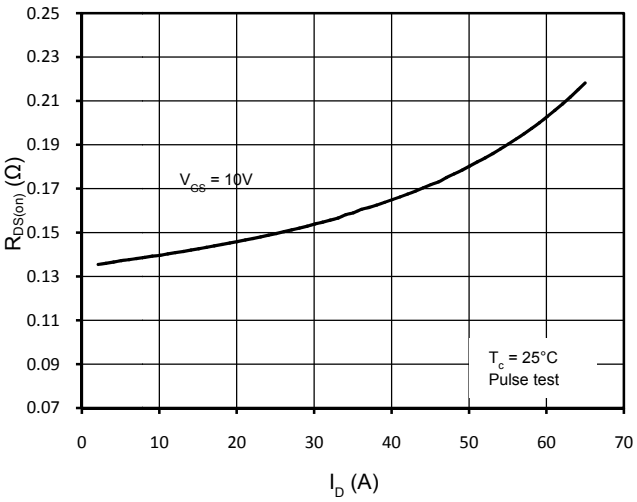


Figure 3. Static Drain-Source On Resistance

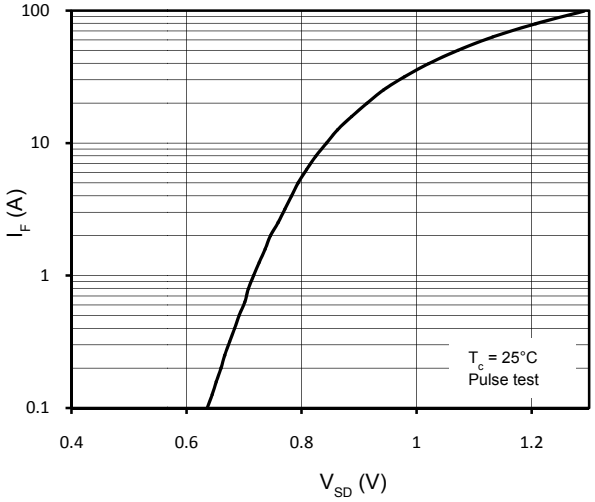


Figure 4. Body- Diode Forward Characteristics

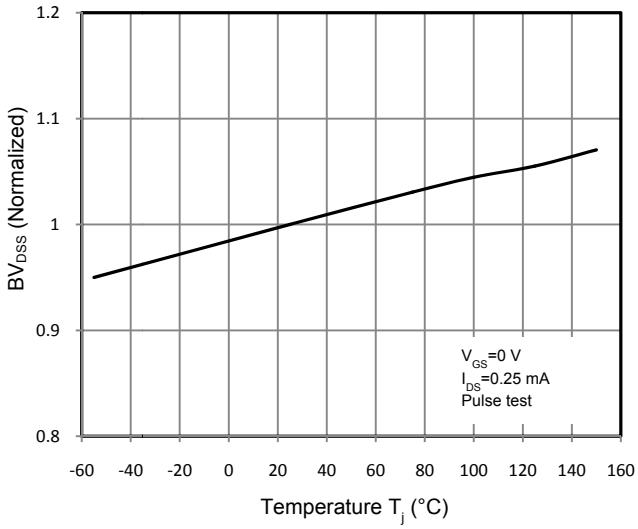


Figure 5. Normalized BV_{DSS} vs. Temperature

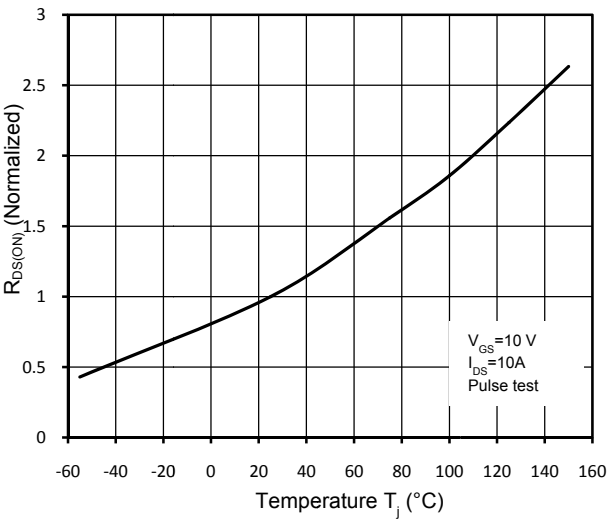


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

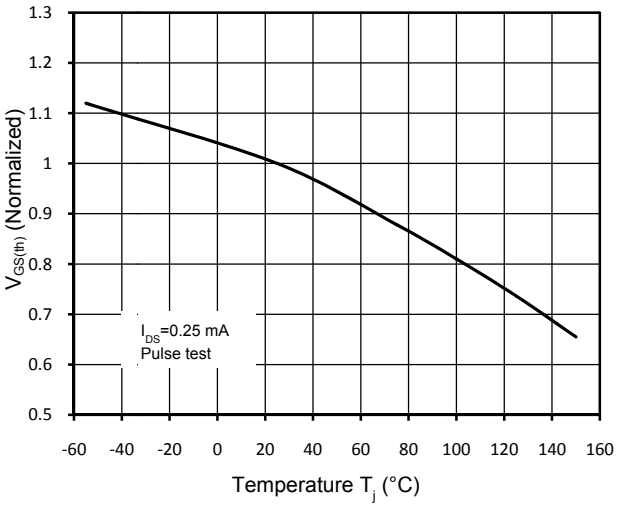


Figure 7. Threshold Voltage vs. Temperature

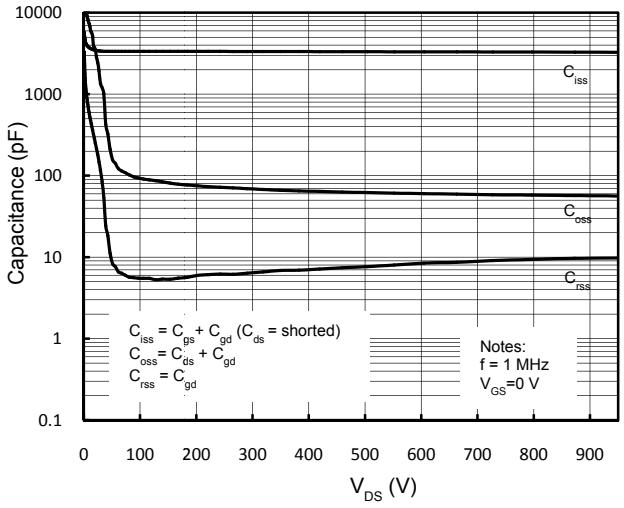


Figure 8. Capacitance Characteristics

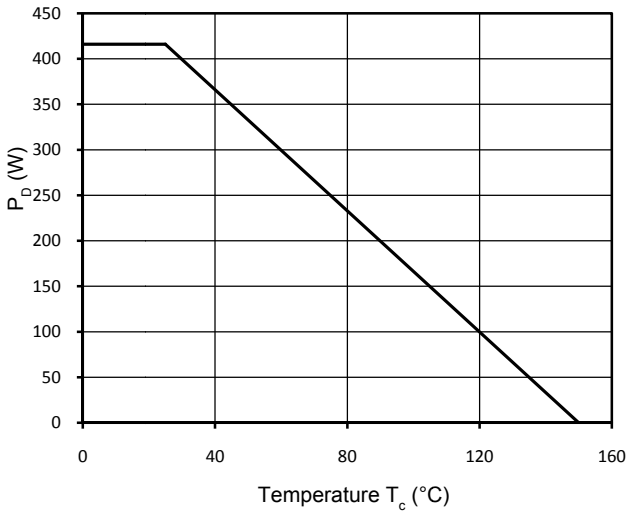


Figure 9. Power Dissipation

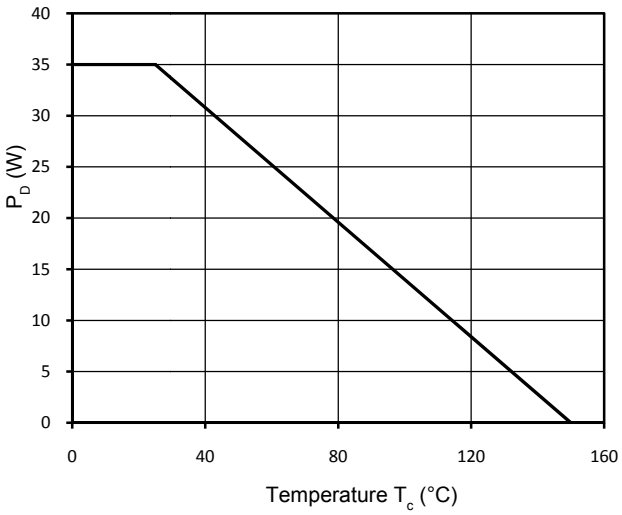


Figure 10. Power Dissipation (TO-220F)

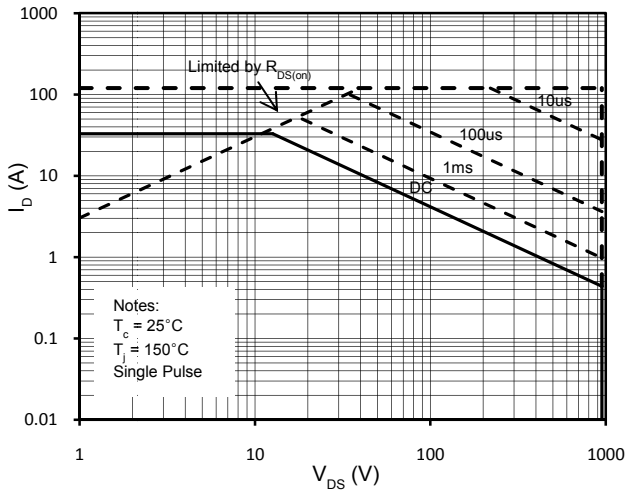


Figure 11. Maximum Safe Operating Area

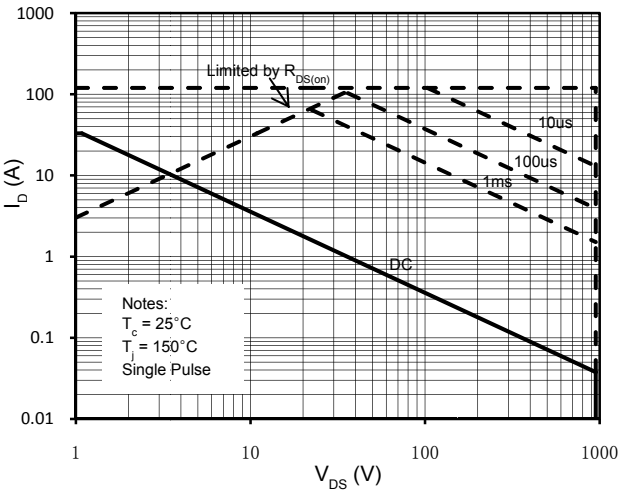


Figure 12. Maximum Safe Operating Area(TO-220F)

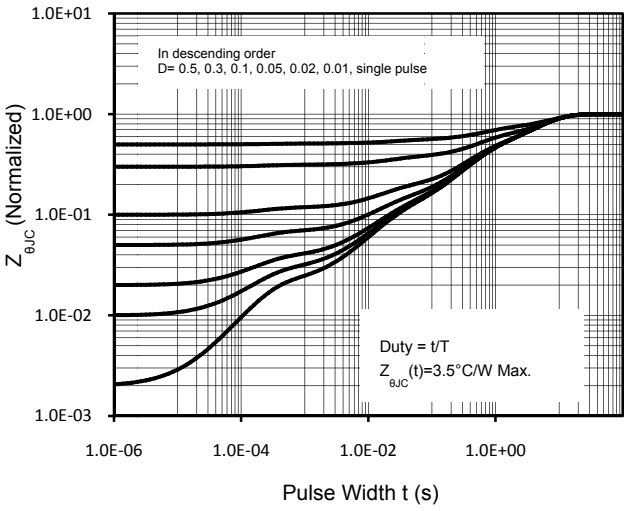


Figure 13. Transient Thermal Response Curve (TO-220F)

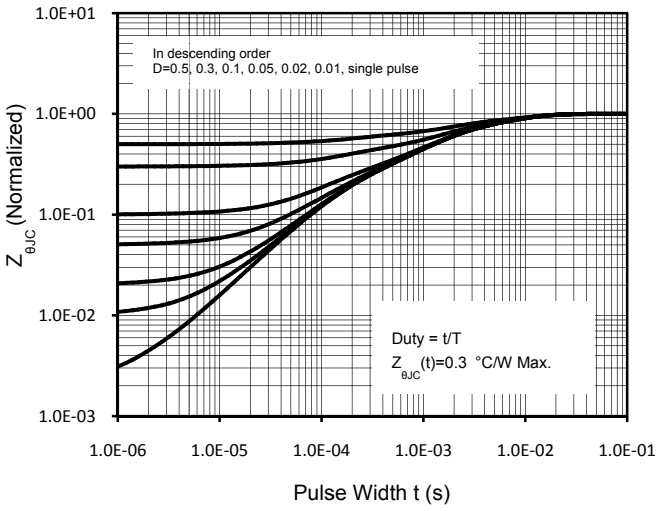


Figure 14. Transient Thermal Response Curve

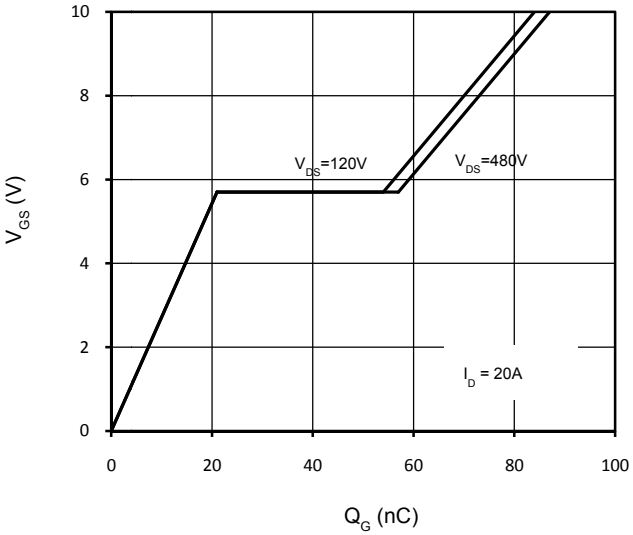
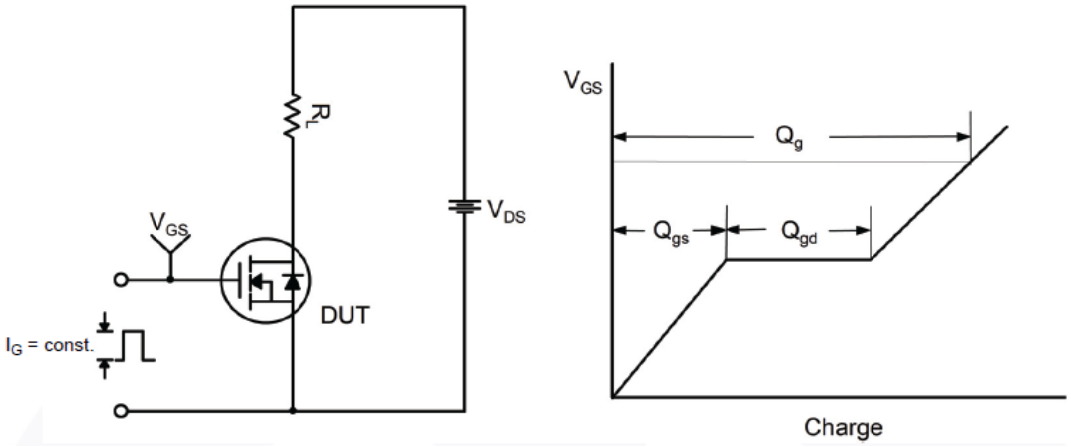
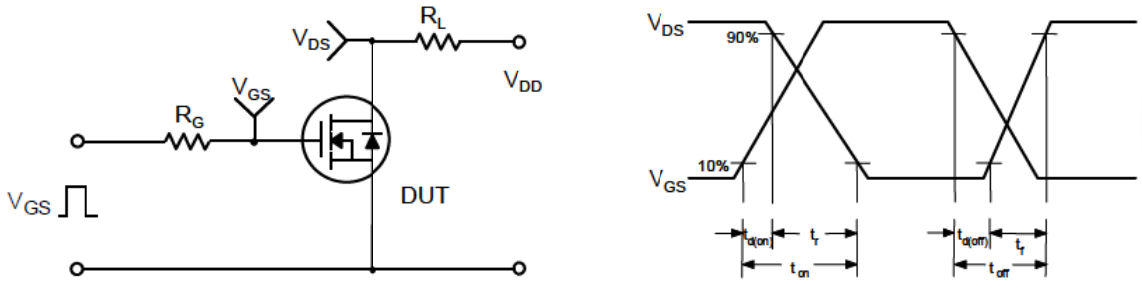


Figure 15. Gate Charge Characteristics

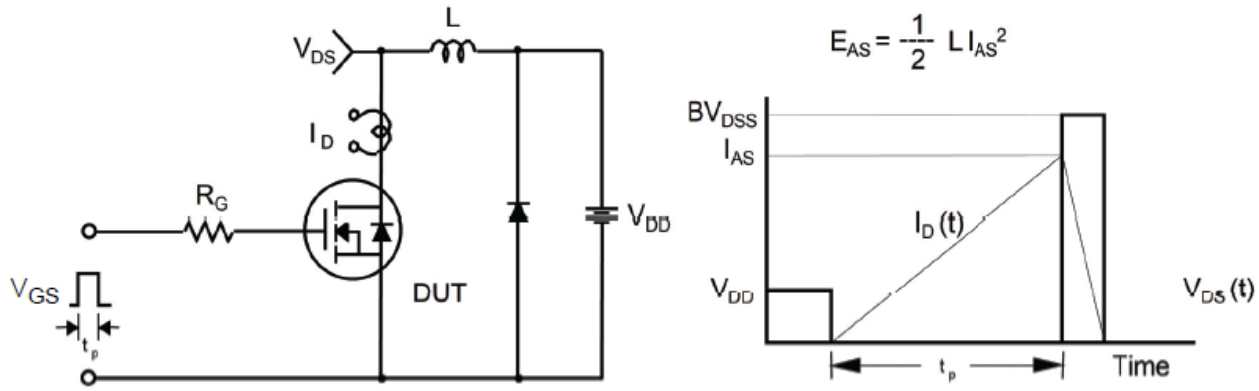
Gate Charge Test Circuit & Waveform



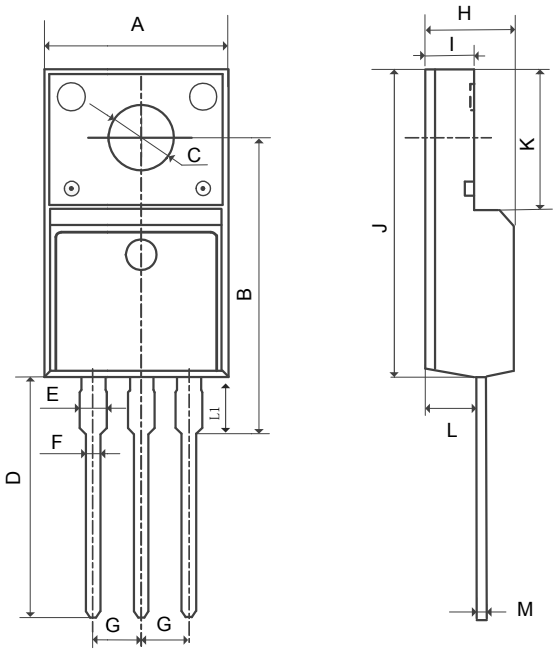
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



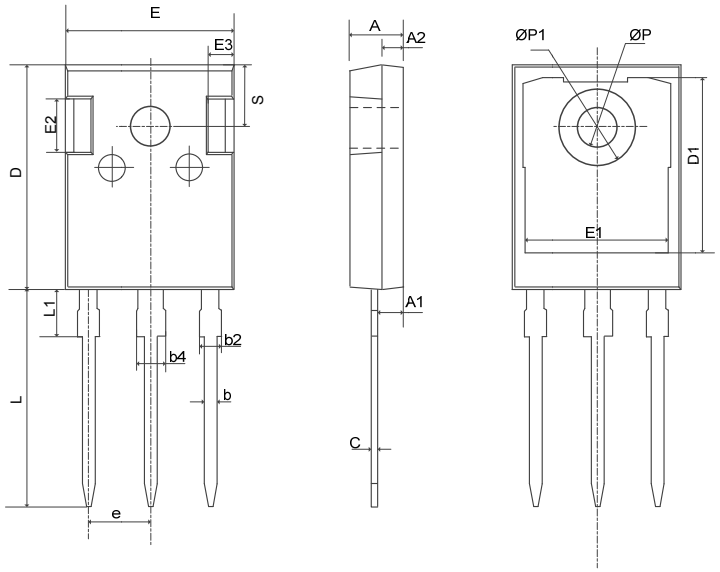
Mechanical Dimensions for TO-220F



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.96	10.36
B	15.10	16.10
C	3.03	3.38
D	12.64	13.28
E	1.18	1.58
F	0.70	0.95
G	2.54REF	
H	4.50	4.90
I	2.34	2.74
J	15.57	16.17
K	6.70REF	
L	2.56	2.96
M	0.40	0.65
L1	2.85	3.45

Mechanical Dimensions for TO-247



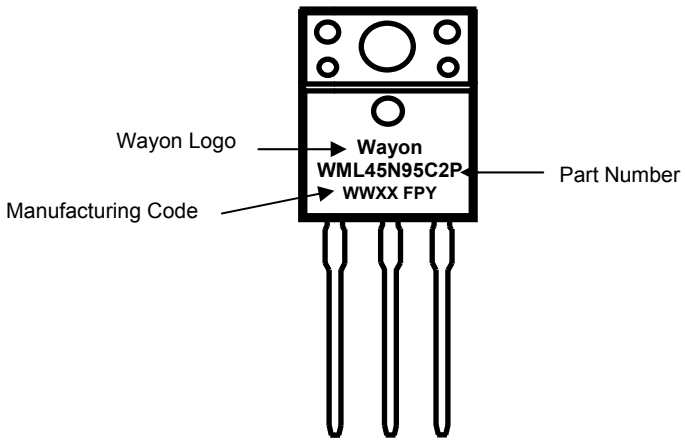
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.80	5.21
A1	2.21	2.61
A2	1.85	2.16
b	1.07	1.36
b2	1.91	2.41
b4	2.87	3.38
c	0.51	0.75
D	20.70	21.30
D1	16.25	17.65
E	15.50	16.13
E1	12.38	13.60
E2	3.68	5.20
E3	1.00	2.70
e	5.44BSC	
L	19.62	20.32
L1	—	4.40
ØP	3.40	3.80
ØP1	—	7.30
S	6.15BSC	

Ordering Information

Part	Package	Marking	Packing method
WML45N95C2P	TO-220F	WML45N95C2P	Tube
WMJ45N95C2P	TO-247	WMJ45N95C2P	Tube

Marking Information



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WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

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