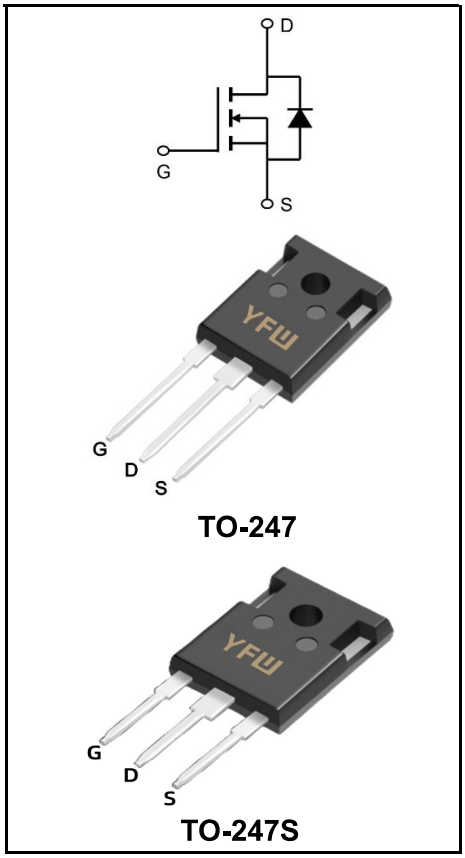
900V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

MAIN CHARACTERISTICS

I_D	13A
V_{DS}	900V
R_{DSON}-typ(@V_{GS}=10V)	＜0.7Ω(Typ:0.61Ω)



FEATURES

- Fast Switching
- Low ON Resistance
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

APPLICATION

- Power switch circuit of adaptor and charger.

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{Gs}	±30	V
Continue Drain Current Tc=25°C	I_D	13	A
Continue Drain Current Tc=100°C	I_D	8.1	A
Pulsed Drain Current (Note1)	I_{DM}	52	A
Power Dissipation	P_D	227	W
Derating Factor above 25°C	P_D	2	W/°C
Single Pulse Avalanche Energy	E_{AS}	720	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.55	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	900	975	-	V
Drain-Source Leakage Current	V_{DS}=900V,V_{GS}=0V,Ta =25°C	I_{DSS}	-	-	25	μA
	V_{DS}=720V,V_{GS}=0V,Ta=125°C		-	-	250	μA
Gate Leakage Current	V_{GS}=±30V,V_{DS}=0V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	3	3.8	5	V
Drain-Source On-State Resistance	V_{GS}=10V,I_D=6.5A	$R_{DS(ON)}$	-	0.61	0.7	Ω
Forward Transconductance	V_{DS}=15V,I_D=6.5A	gfs	-	16	-	S
Gate resistance	f = 1.0MHz	Rg	-	1.3	-	Ω
Input Capacitance	V_{GS}=0V,V_{DS}=25V, f = 1 MHz	C_{iss}	-	5023	-	pF
Output Capacitance		C_{oss}	-	294	-	
Reverse Transfer Capacitance		C_{rss}	-	3.3	-	
Turn-on Delay Time(Note2)	I_D = 13 A, V_{DD} = 450V, R_G= 25 Ω	$t_{d(on)}$	-	52	-	ns
Rise Time(Note2)		T_r	-	59	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	90	-	
Fall Time(Note2)		t_f	-	48	-	
Total Gate Charge(Note2)	I_D = 13A, V_{DD} = 720 V, V_{GS} = 10 V	Q_g	-	87	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	27	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	31	-	
Maximun Body-Diode Continuous Current		I_S	-	-	13	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	52	A
Drain-Source Diode Forward Voltage	I_{SD} =13A,V_{GS}=0V,	V_{SD}	-	-	1.5	V
Reverse Recovery Time(Note2)	I_{SD}=13A,V_{GS}=0V, dI_F / dt = 100 A/μs	t_{rr}	-	423	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	5.5	-	μC
Reverse Recovery Charge(Note2)		Q_{rr}	-	28.6	-	A

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

Ratings and Characteristic Curves

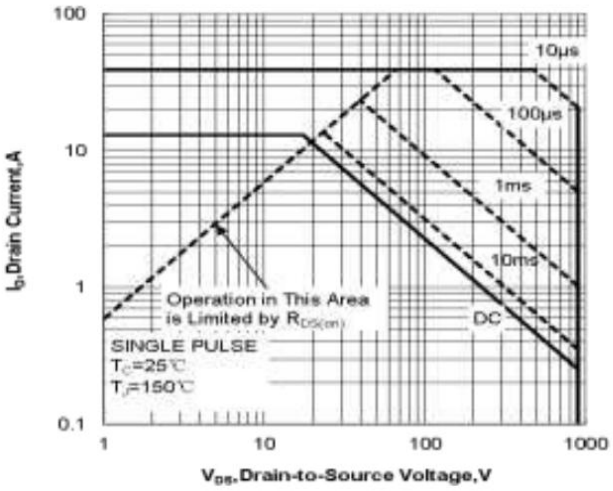


Figure 1 Maximum Forward Bias Safe Operating Area

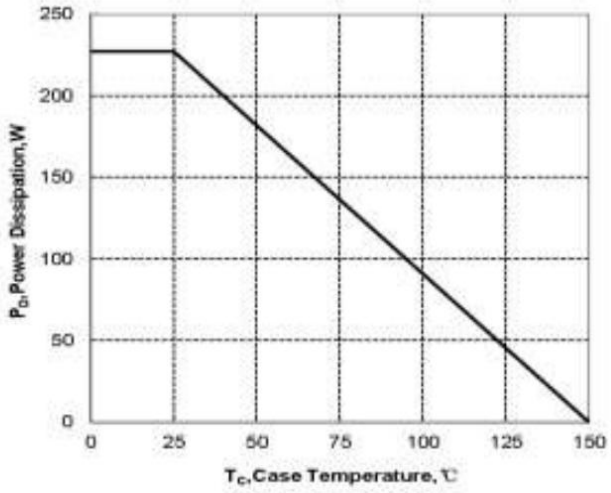


Figure 2 Maximum Power dissipation vs Case Temperature

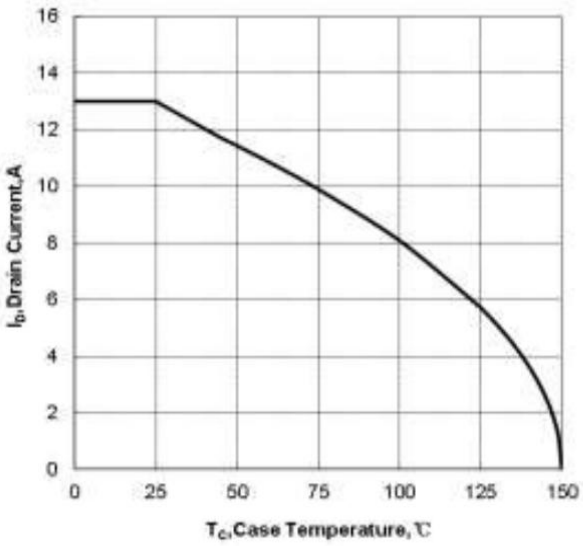


Figure 3 Maximum Continuous Drain Current vs Case Temperature

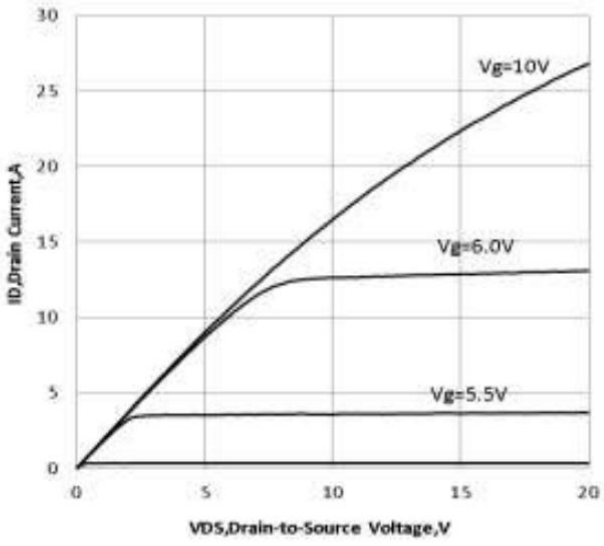


Figure 4 Typical Output Characteristics

Ratings and Characteristic Curves

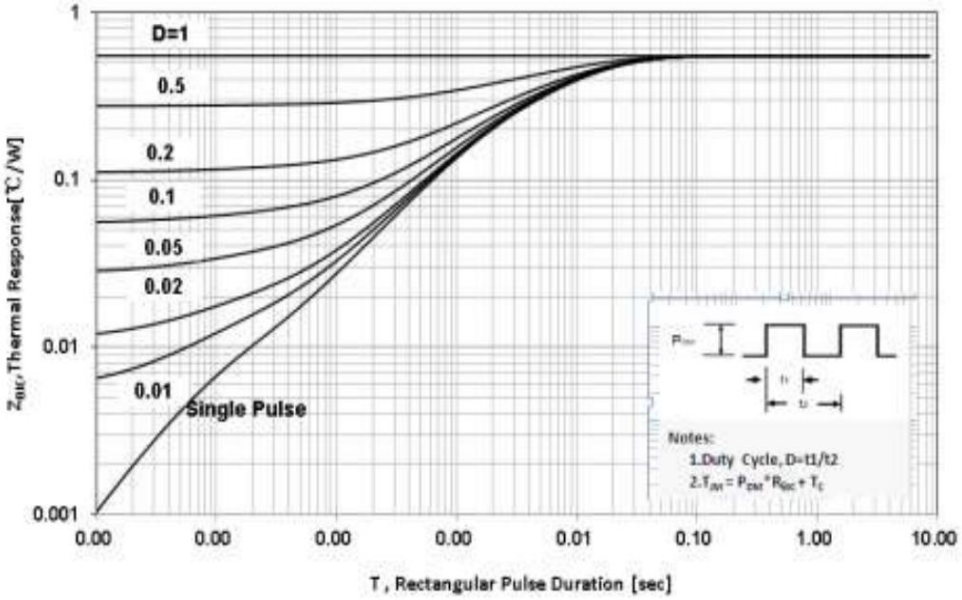


Figure 5 Maximum Effective Thermal Impedance , Junction to Case

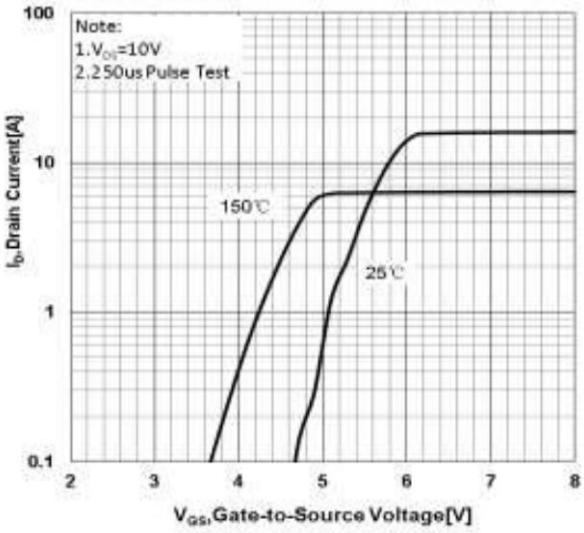


Figure 6 Typical Transfer Characteristics

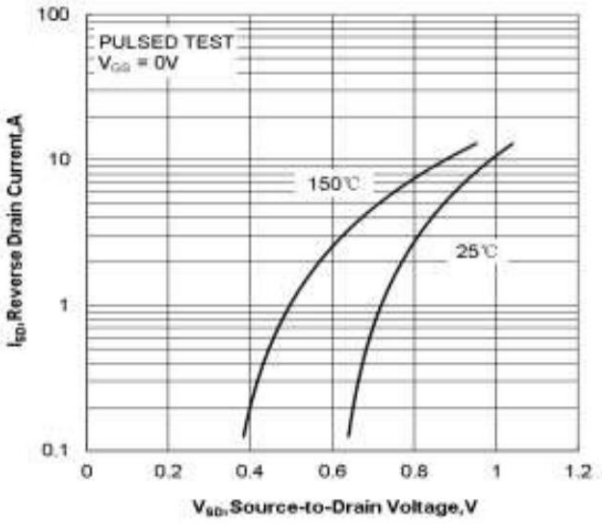


Figure 7 Typical Body Diode Transfer Characteristics

Ratings and Characteristic Curves

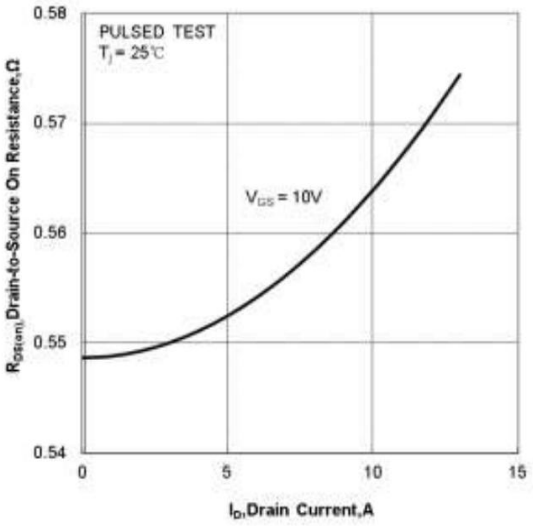


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

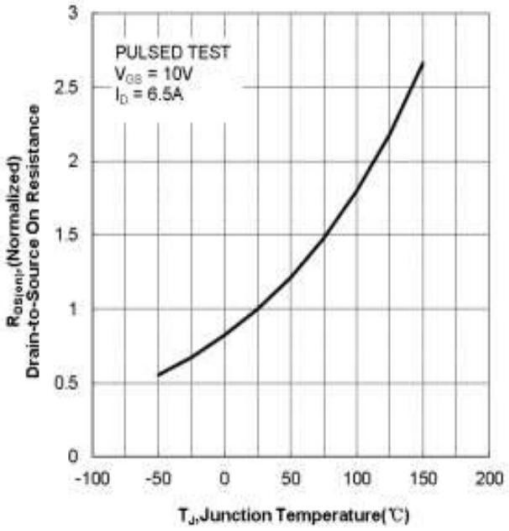


Figure 9 Typical Drian to Source on Resistance vs Junction Temperature

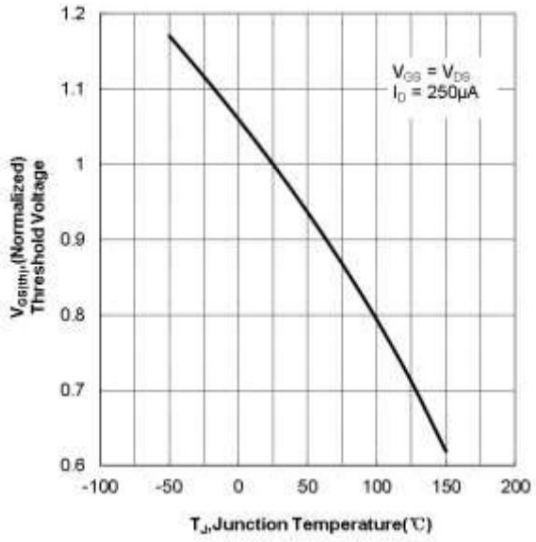


Figure 10 Typical Theshold Voltage vs Junction Temperature

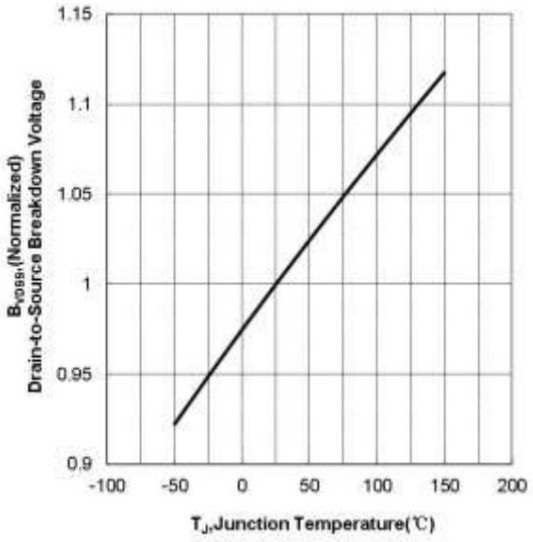


Figure 11 Typical Breakdown Voltage vs Junction Temperature

Ratings and Characteristic Curves

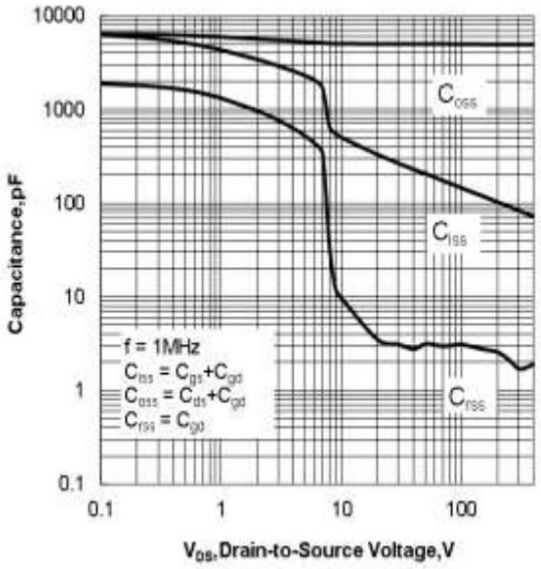


Figure 12 Typical Capacitance vs Drain to Source Voltage

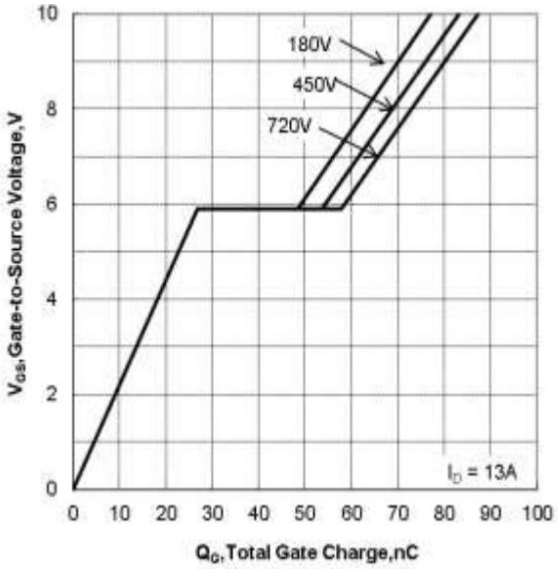
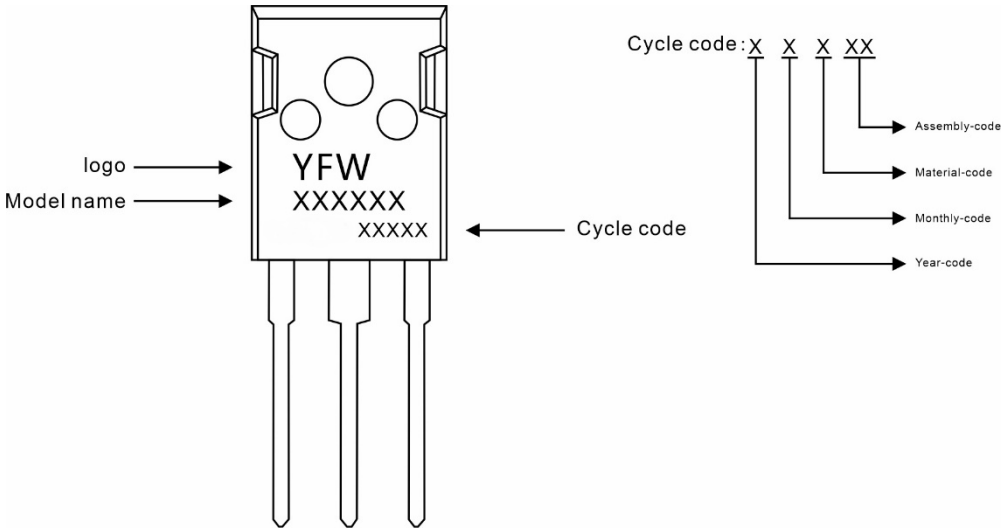


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Marking Diagram

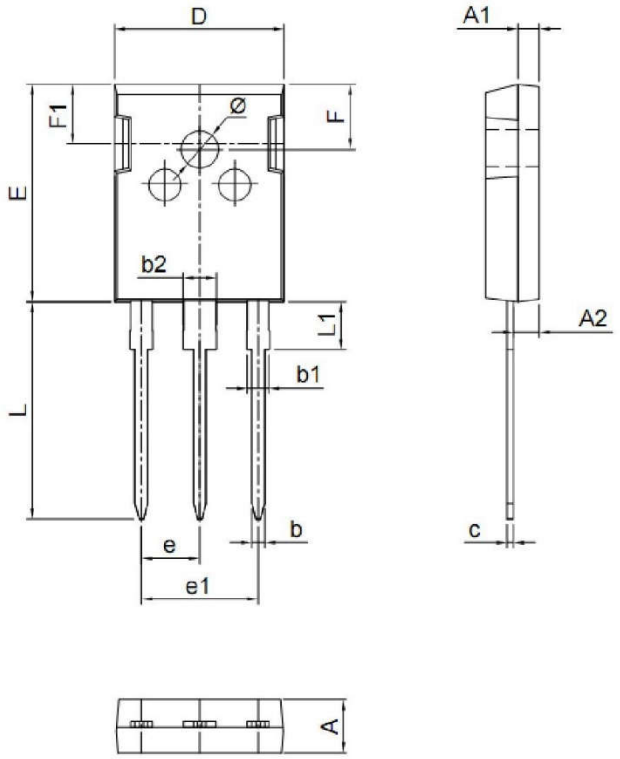


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW13N90AP	TO-247	0.209oz(5.93g)	30pcs/tube	600PCS/Box 2400PCS/Carton

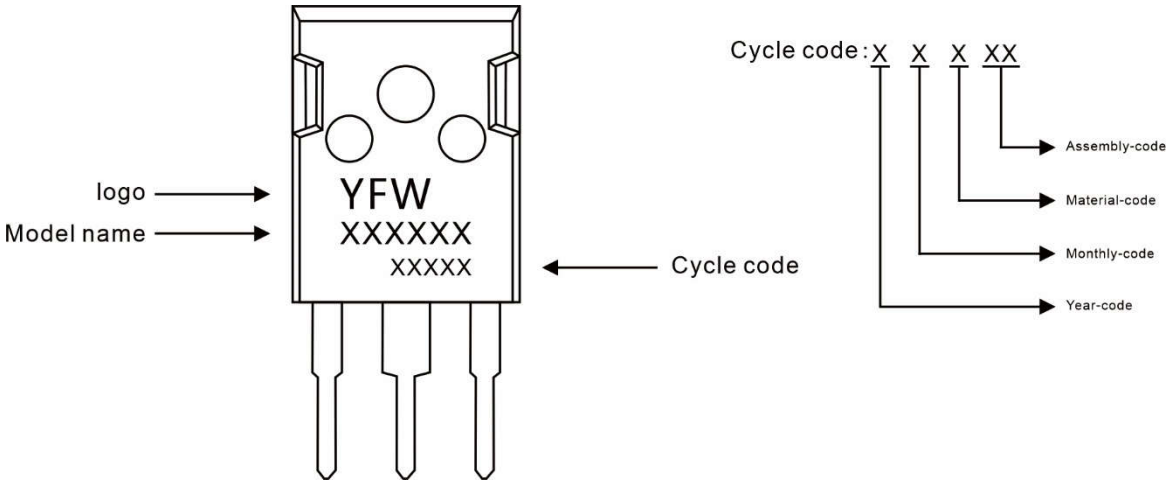
Package Dimensions

TO-247



Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	4.90	5.10	0.193	0.201
A1	1.90	2.10	0.075	0.083
A2	2.29	2.54	0.090	0.100
b	1.00	1.40	0.039	0.055
b1	2.00	2.20	0.079	0.087
b2	3.00	3.20	0.118	0.126
c	0.50	0.70	0.020	0.028
D	15.75	16.05	0.620	0.632
E	20.20	20.80	0.795	0.819
e	5.45 (BSC)		0.215 (BSC)	
e1	10.90 (BSC)		0.429 (BSC)	
F	6.05	6.25	0.238	0.246
F1	5.80	6.00	0.228	0.236
L	20.10	20.40	0.791	0.803
L1	4.05	4.35	0.159	0.171
Φ	3.50	3.70	0.138	0.146

Marking Diagram

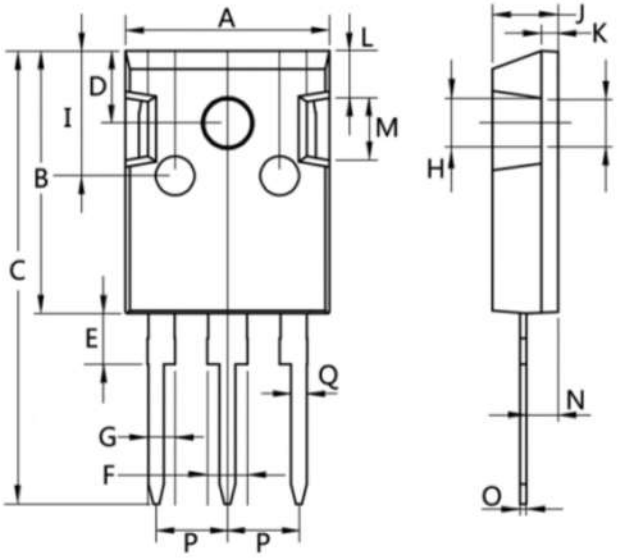


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW13N90APS	TO-247S	0.158oz(4.48g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247S



Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	15.0	16.0	0.59	0.63
B	19.5	20.5	0.77	0.81
C	33.5	35.5	1.32	1.40
D	5.0	6.0	0.20	0.24
E	3.5	4.5	0.14	0.18
F	2.5	3.5	0.10	0.14
G	1.75	2.5	0.07	0.14
H	3.0	4.0	0.12	0.16
I	9.0	11.0	0.35	0.43
J	4.9	5.1	0.19	0.20
K	1.0	1.3	0.04	0.05
L	3.75	4.25	0.15	0.17
M	4.75	5.25	0.19	0.21
N	1.8	2.2	0.07	0.09
O	0.45	0.6	0.018	0.024
P	5.08		0.2	
Q	1.2	1.3	0.05	0.051

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