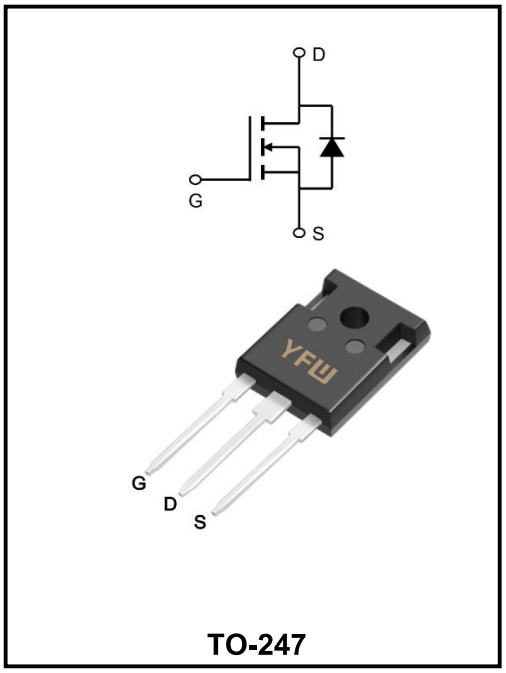
100V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	220A
V_{DS}	100V
R_{DSON}-typ(@V_{GS}=10V)	＜3.0mΩ(Typ:2.1mΩ)



TO-247

Description

This model is an advanced SGT MOSFET with better characteristics, such as fast switching time, low gate charge and low on state resistance.
Such enhanced MOSFET are commonly used in switching power supplies and adapters for high-speed switching applications.

FEATURES

- YFW-SGT technology
- Extremely low on impedance
- Low gate charge
- Superior switching characteristics

APPLICATIONS

- LED power supplies
- Cell Phone Charger
- Standby Power

MECHANICAL DATA

- Case:TO-247/AP
- Case Material: “Green” molding compound, UL flammability classification 94V-0,“Halogen-free”.

Absolute Maximum Ratings (Ta=25°C, Unless Otherwise Specified)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	220	A
Pulsed Drain Current (Note2)	I_{DM}	840	A
Single Pulse Avalanche Energy (Note3)	E_{AS}	500	mJ
Power Dissipation (Tc = 25°C)	P_D	296	W
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.42	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	°C/W

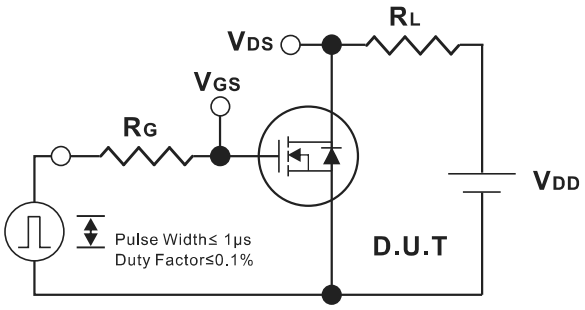
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2.Repetitive Rating: Pulse width limited by maximum junction temperature.
3.L= 0.5mH, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)

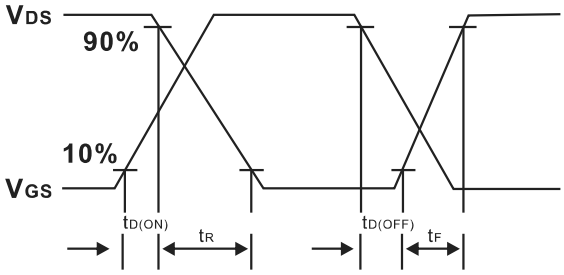
Parameter		Test Conditions	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage		V_{GS}=0V,I_D=250uA	BV_{DSS}	100			V
Drain-Source Leakage Current		V_{DS}=100V,V_{GS}=0V	I_{DSS}			1.0	μA
Gate- Source Leakage Current	Forward	V_{GS}=20V,V_{DS}=0V	I_{GSS}			100	nA
	Reverse	V_{GS}=-20V,V_{DS}=0V				-100	
Gate Threshold Voltage		V_{DS}=V_{GS},I_D=250uA	$V_{GS(th)}$	2.0		4.0	V
Static Drain-Source On-State Resistance		V_{GS}=10V,I_D=20A	$R_{DS(ON)}$		2.1	3.0	mΩ
Transconductance		V_{DS}=5V,I_D=20A	g_{fs}		30		S
Input Capacitance		V_{DS}=25V V_{GS}=0V f=1.0MHz	C_{iss}		8600		pF
Output Capacitance			C_{oss}		4450		
Reverse Transfer Capacitance			C_{rss}		778		
Total Gate Charge (Note 1)		V_{DS}=50V V_{GS}=10V I_D=20A (NOTE1,2)	Q_g		150		nC
Gate-Source Charge			Q_{gs}		34		
Gate-Drain Charge			Q_{gd}		26		
Turn-On Delay Time (Note 1)		V_{DS}=50V V_{GS}=10V R_G=3.0Ω I_D=20A (NOTE1,2)	$t_{d(on)}$		30		ns
Turn-On Rise Time			T_r		26		
Turn-Off Delay Time			$t_{d(OFF)}$		68		
Turn-Off Fall Time			t_f		12.4		
Gate resistance		V_{GS}=0V,V_{DS}=0V,f=1MHz	R_G		2.5		Ω
Drain-Source Diode Forward Voltage (Note 1)		I_{SD}=20A,V_{GS}=0V	V_{SD}			1.2	V
Reverse Recovery Time (Note 1)		I_F=20A di/dt=100A/us	t_{rr}		100		ns
Reverse Recovery Charge			Q_{rr}		202		uC

Notes:
1.Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2.Essentially independent of operating temperature.

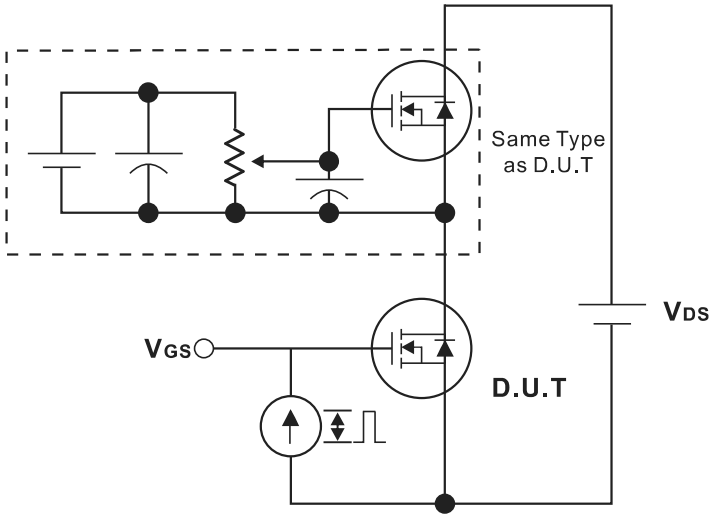
Test Circuits and waveforms



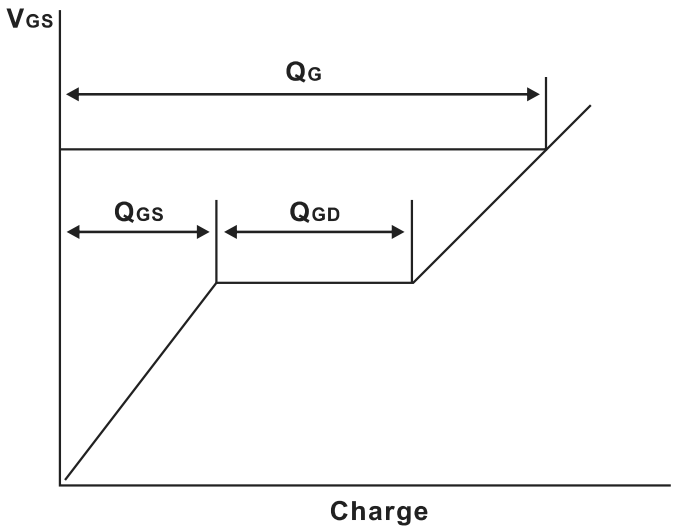
Switching Test Circuit



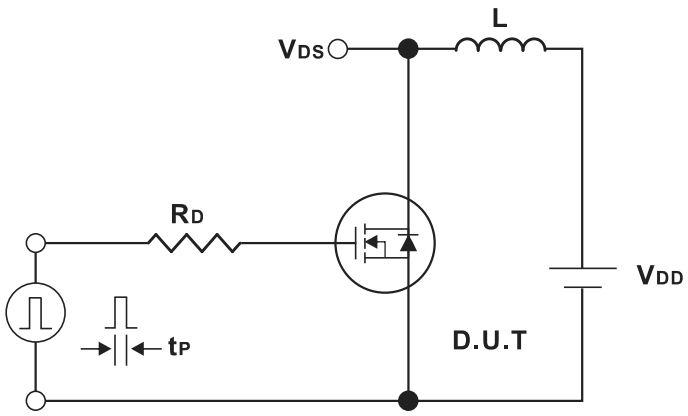
Switching Waveforms



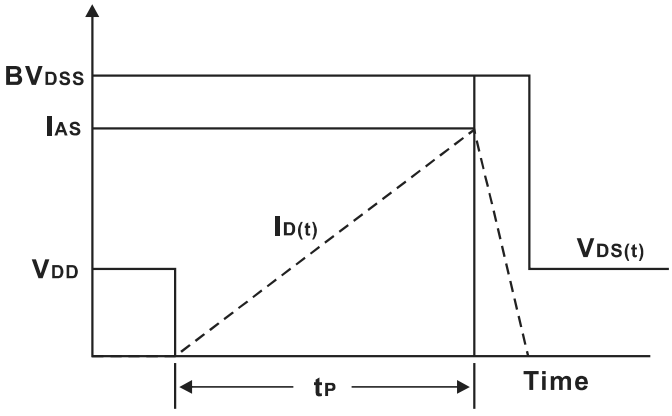
Gate Charge Test Circuit



Gate Charge Waveform

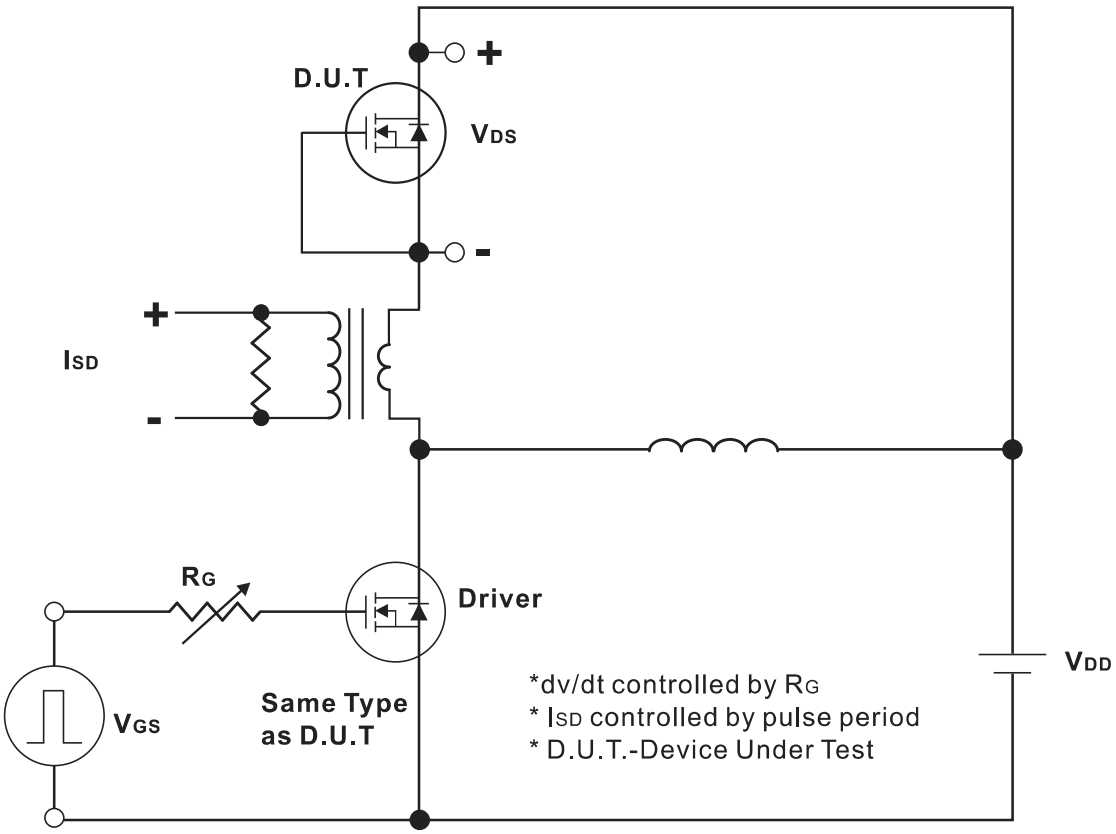


Unclamped Inductive Switching Test Circuit

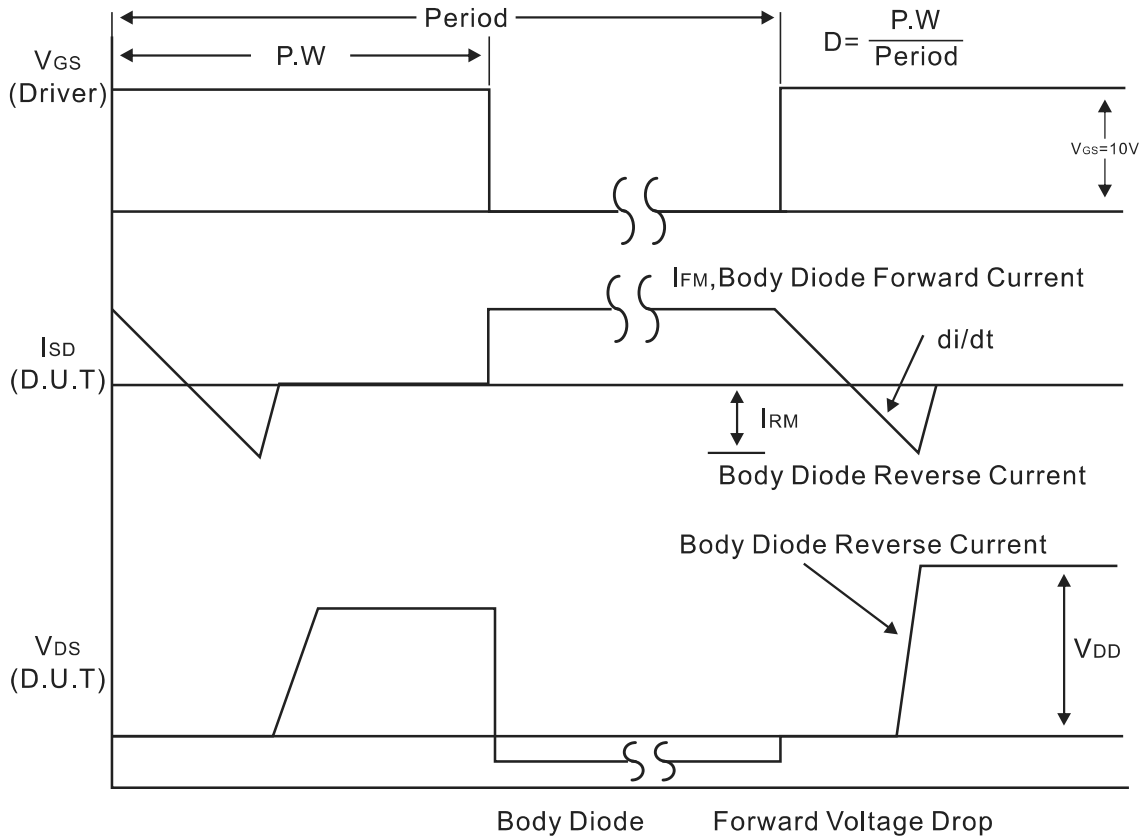


Unclamped Inductive Switching Waveforms

Test Circuits and waveforms



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

Typical Characteristics

Fig.1 Output characteristics

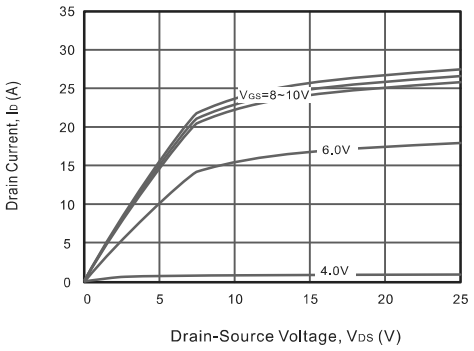


Fig.2 Power Dissipation

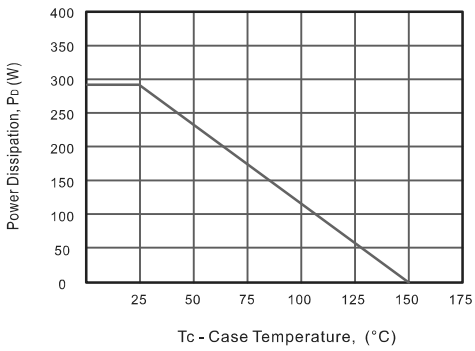


Fig.3 Drain Current Derating

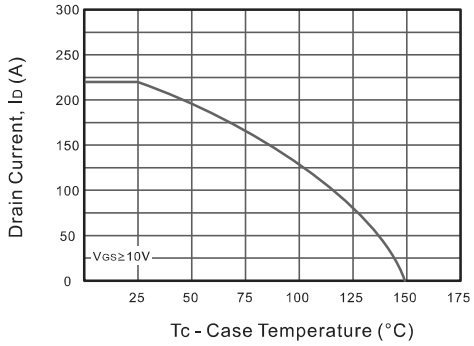


Fig.4 Drain-Source On-Resistance vs. Drain Current

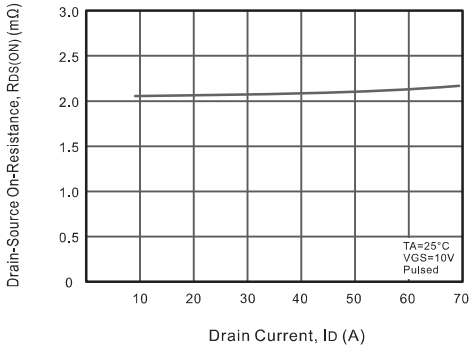


Fig.5 Gate Threshold Voltage vs. Junction Temperature

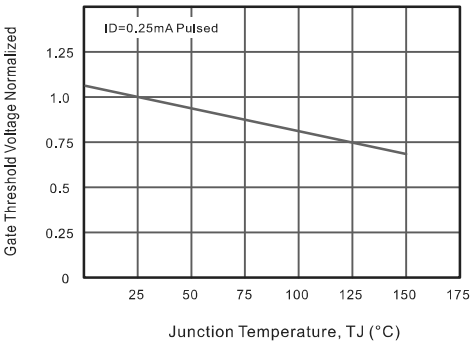


Fig.6 Body-diode Forward Characteristics

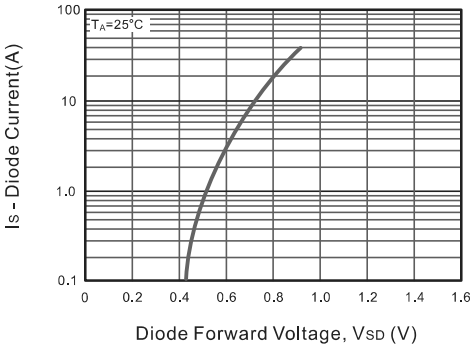


Fig.7 Drain-Source On-Resistance vs. Junction Temperature

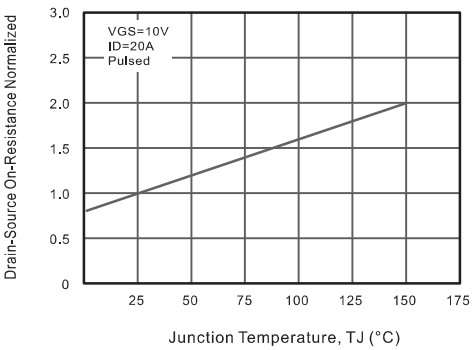
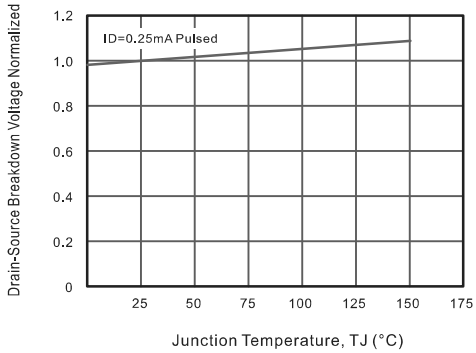


Fig.8 Breakdown Voltage vs. Junction Temperature



Typical Characteristics

Fig.9 Capacitance Characteristics

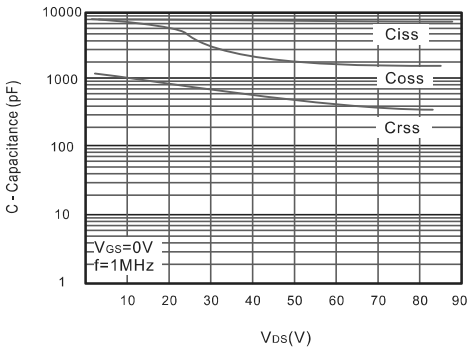


Fig.10 Gate Charge Characteristics

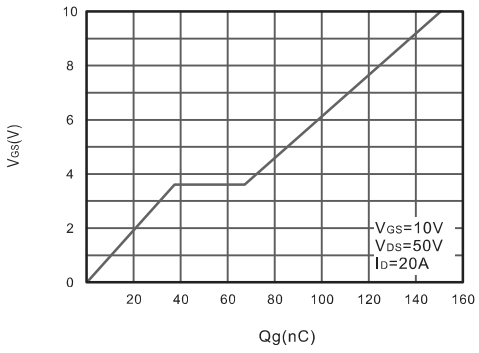


Fig.11 Safe Operating Area

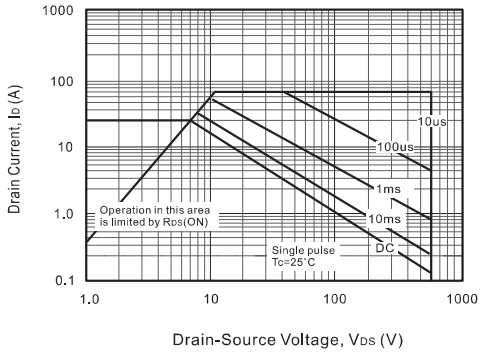
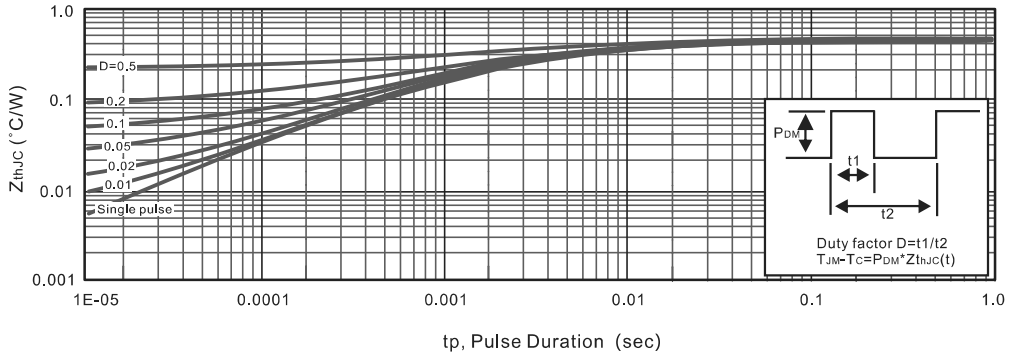
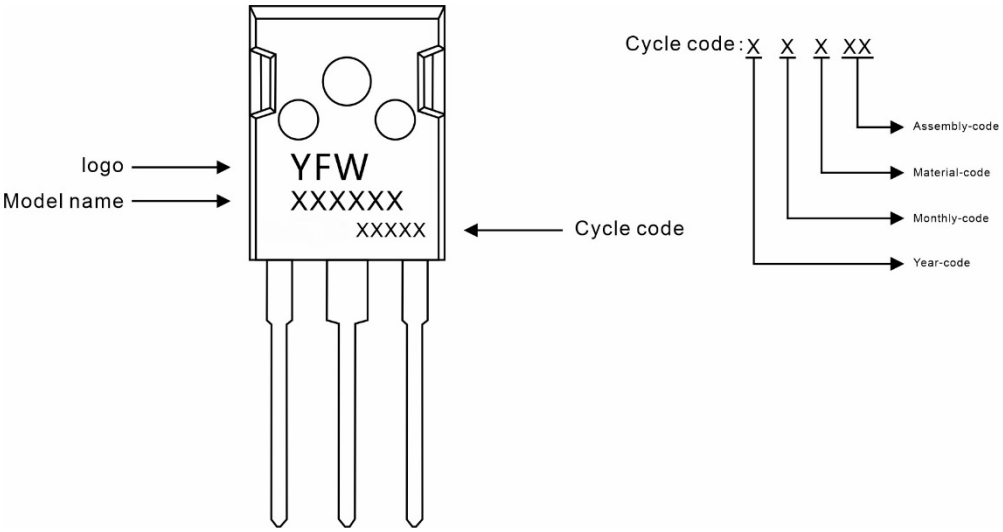


Fig.12 Max. Transient Thermal Impedance



Marking Diagram

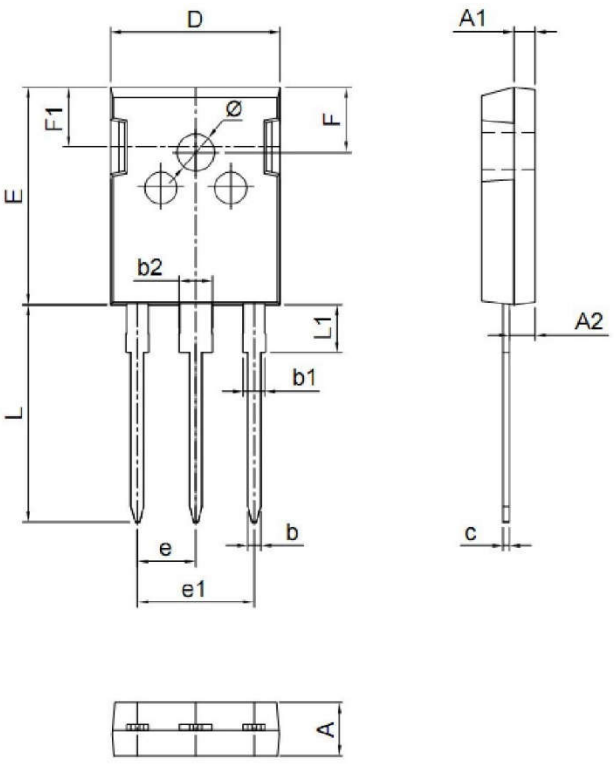


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG220N10HAP	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

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