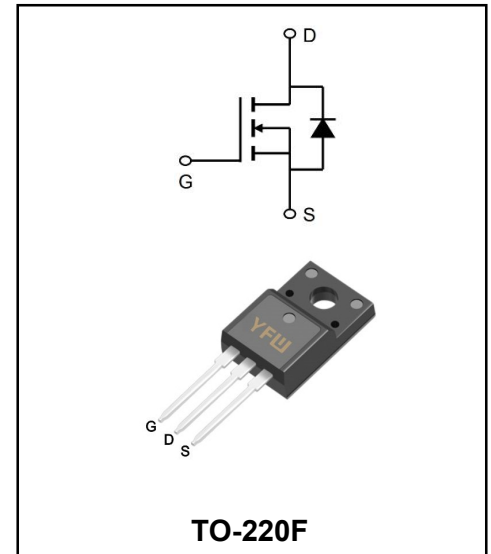


800V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

I_D	18A
V_{DSS}	800V
R_{DS(on)-typ}(@V_{GS}=10V)	<0.25Ω(Typ:0.22Ω)



DESCRIPTION

The power MOSFET using super junction technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of Low EMI to designers as well as low switching loss.

FEATURES

- ♦Fast switching capability
- ♦Low On-Resistance
- ♦100% Avalanche tested
- ♦100% ΔV_{DS} tested

MECHANICAL DATA

- ♦Case: TO-220F/AF
- ♦RoHS compliant
- ♦Case Material: “Green” molding compound, UL flammability classification 94V-0, “Halogen-free”.

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current T _c =25°C T _c =100°C	I_D	18 11.4	A
Pulsed Drain Current (Note2)	I_{DM}	44	A
Avalanche Energy Single Pulsed (Note 3)	E_{AS}	246	mJ
Power Dissipation (T _c = 25°C)	P_D	33.4	W
Operating Temperature Range	T_J	-50 to +150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C
Thermal Resistance, Junction to Case	R_{θJC}	3.74	°C/W
Thermal Resistance, Junction to Ambient(min. footprint)	R_{θJA}	80	°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=10mH,V_{DD}=50V, R_G=25Ω,Starting T_J=25°C

Maximum Ratings at Ta =25°C unless otherwise specified

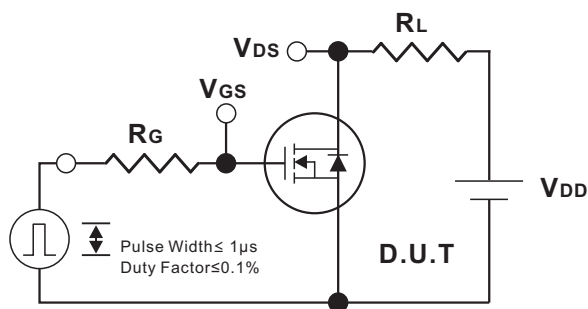
Characteristics		Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage		$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	800	-	-	V
Drain-Source Leakage Current		$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1.0	μA
Gate Leakage Current	Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}			1.0	μA
	Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$		-	-	-1.0	
Gate-Source Threshold Voltage		$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2.0	-	4.0	V
Drain-Source On-State Resistance		$V_{GS} = 10\text{ V}, I_D = 5.3\text{ A}$	$R_{DS(ON)}$	-	0.22	0.25	Ω
Transconductance		$V_{DS} = 7.5\text{ V}, I_D = 10\text{ A}$	g_{fs}	-	17	-	S
Input Capacitance		$V_{DS} = 50\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1.0\text{ MHz}$	C_{iss}	-	2000	-	pF
Output Capacitance			C_{oss}	-	33	-	pF
Reverse Transfer Capacitance			C_{rss}	-	3.2	-	pF
Gate resistance		$V_{DS} = 0\text{ V}, f = 1.00\text{ MHz}$	R_G	-	8.0	-	Ω
Total Gate Charge(Note1)		$V_{GS} = 640\text{ V}$ $V_{GS} = 10\text{ V}$ $I_D = 9.6\text{ A}$ (NOTE1,2)	Q_G	-	43	-	nC
Gate to Source Charge			Q_{GS}	-	8.2	-	nC
Gate to Drain Charge			Q_{GD}	-	12	-	nC
Turn-on Delay Time(Note1)		$V_{DS} = 400\text{ V}, I_D = 9.6\text{ A}$ $R_G = 25\Omega, V_{GS} = 10\text{ V}$ (NOTE1,2)	$t_{d(on)}$	-	41	-	ns
Rise Time			T_r	-	24	-	ns
Turn-Off Delay Time			$t_{d(OFF)}$	-	179	-	ns
Fall Time			t_f	-	17	-	ns
Maximum Continuous Drain -Source Diode Forward Current			I_S	-	-	18	A
Drain-Source Diode Forward Voltage (Note 1)		$I_{SD} = 9.6\text{ A}, V_{GS} = 0\text{ V}$	V_{SD}	-	-	1.3	V
Reverse recovery time (Note 1)		$I_F = 9.6\text{ A}$	t_{rr}	-	365	-	ns
Reverse recovery charge		$dI / dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	4.6	-	μC

Notes:

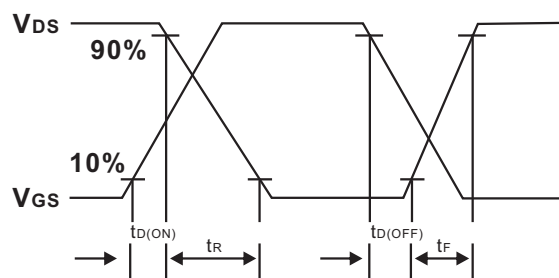
1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

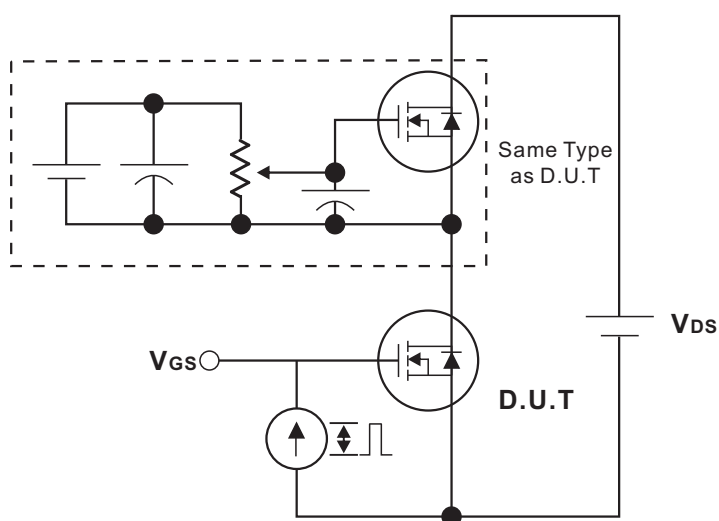
Test Circuits and waveforms



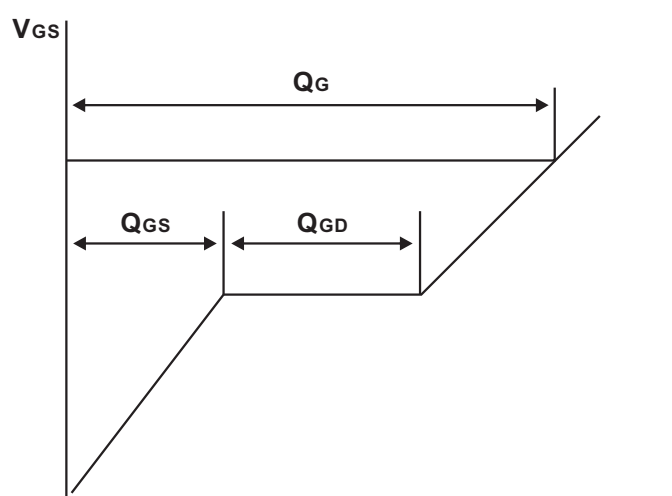
Switching Test Circuit



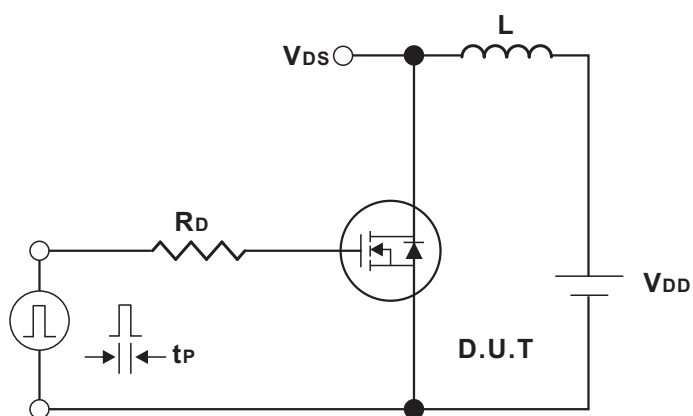
Switching Waveforms



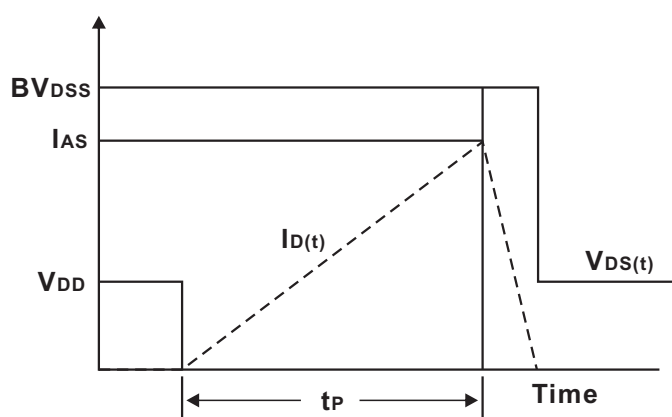
Gate Charge Test Circuit



Charge
Gate Charge Waveform

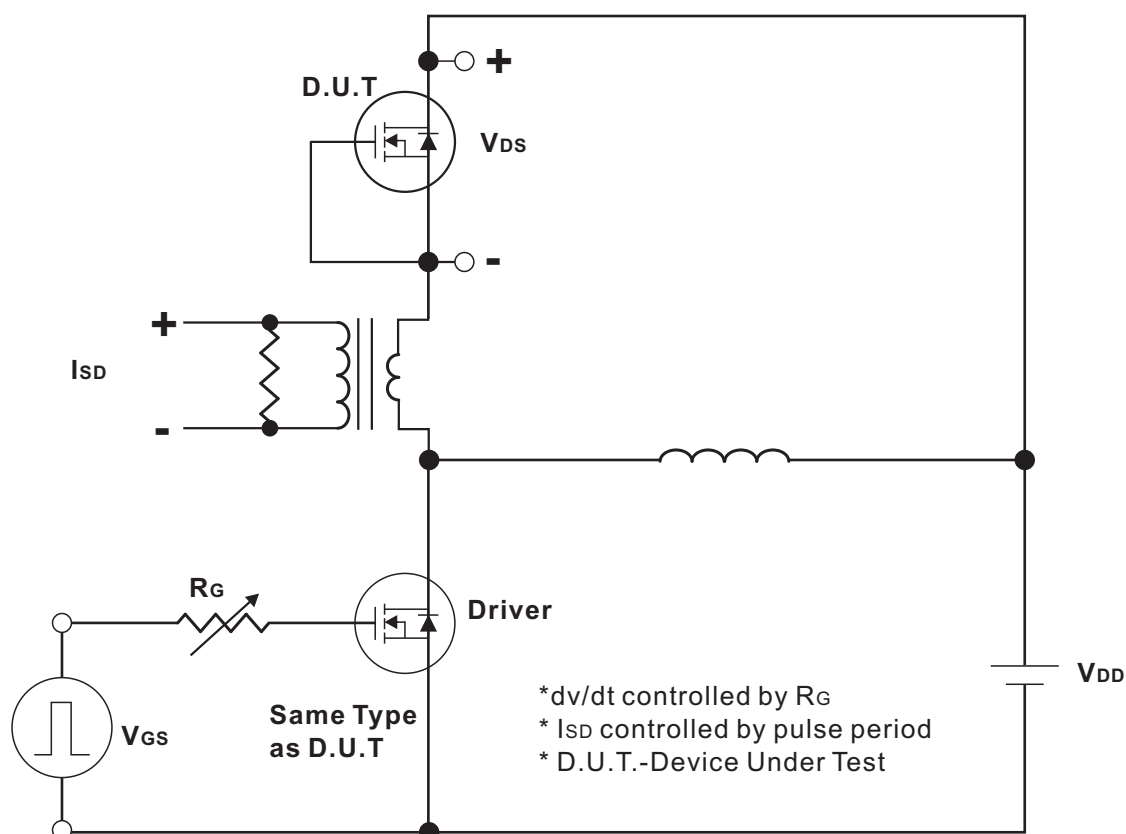


Unclamped Inductive Switching Test Circuit

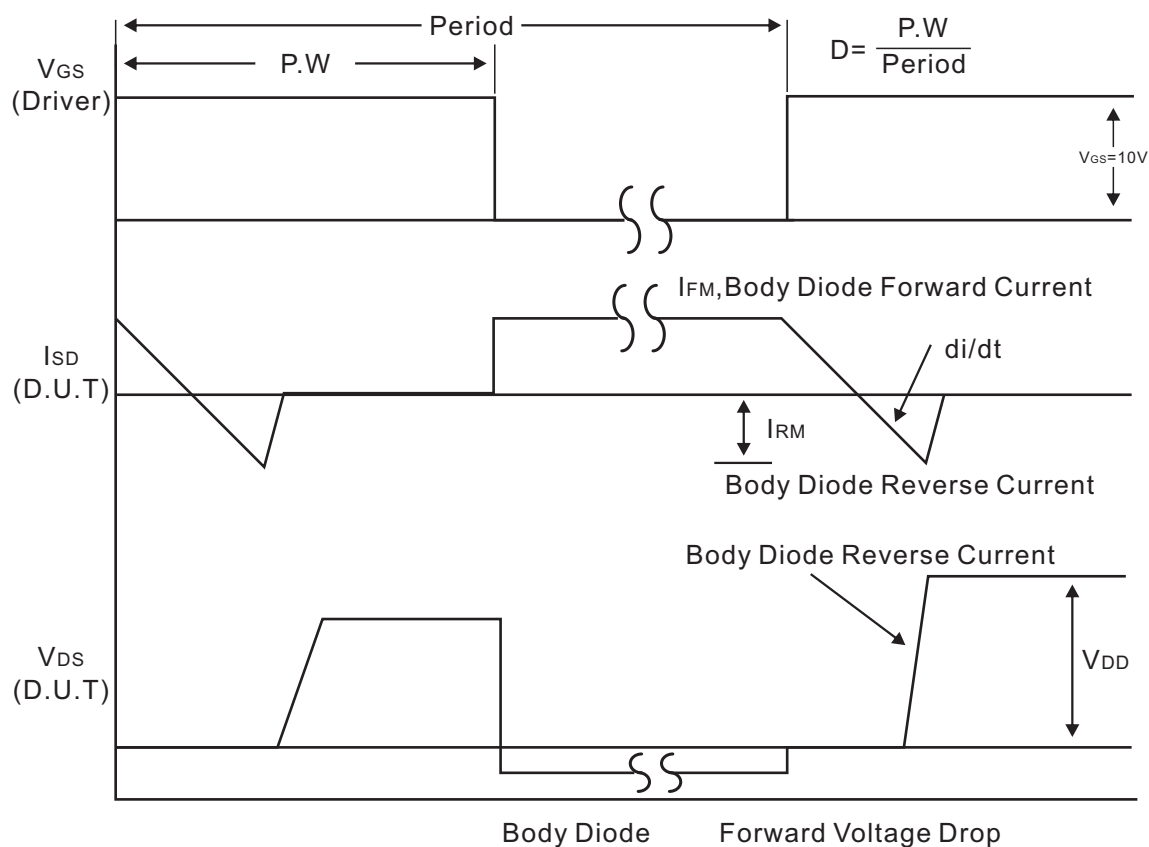


Unclamped Inductive Switching Waveforms

Test Circuits and waveforms



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

Typical Characteristics

Fig.1 Output characteristics

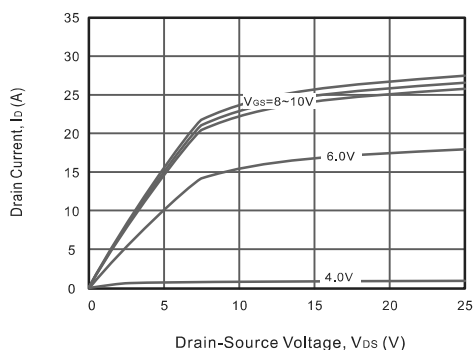


Fig.2 Power Dissipation

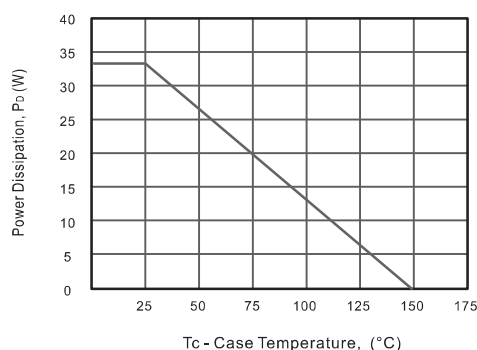


Fig.3 Drain Current Derating

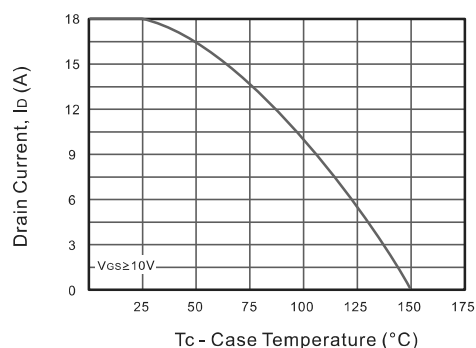


Fig.4 Drain-Source On-Resistance vs. Drain Current

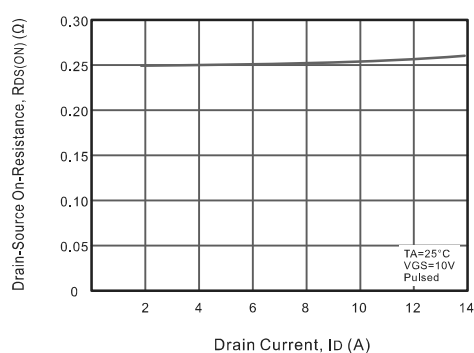


Fig.5 Gate Threshold Voltage vs. Junction Temperature

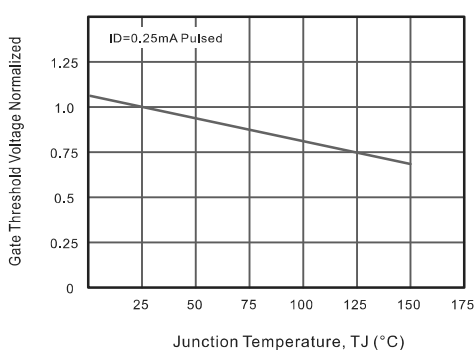


Fig.6 Body-diode Forward Characteristics

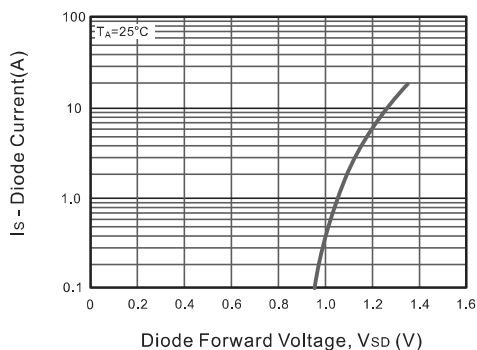


Fig.7 Drain-Source On-Resistance vs. Junction Temperature

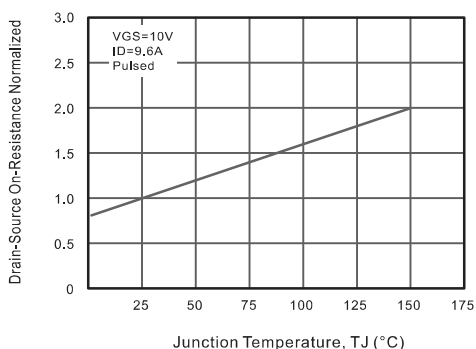
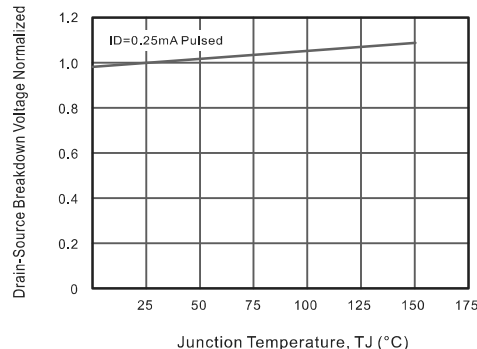


Fig.8 Breakdown Voltage vs. Junction Temperature



Typical Characteristics

Fig.9 Capacitance Characteristics

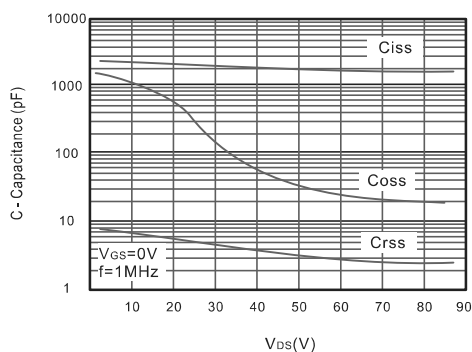


Fig.10 Gate Charge Characteristics

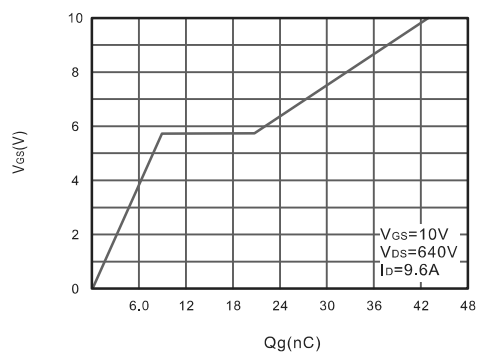


Fig.11 Safe Operating Area

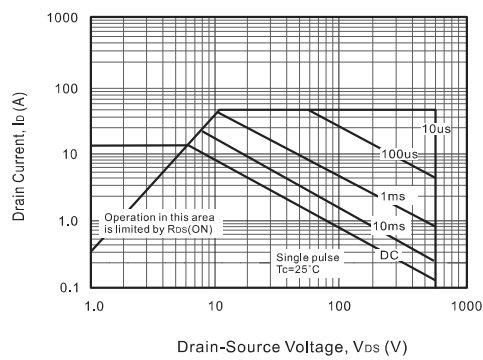
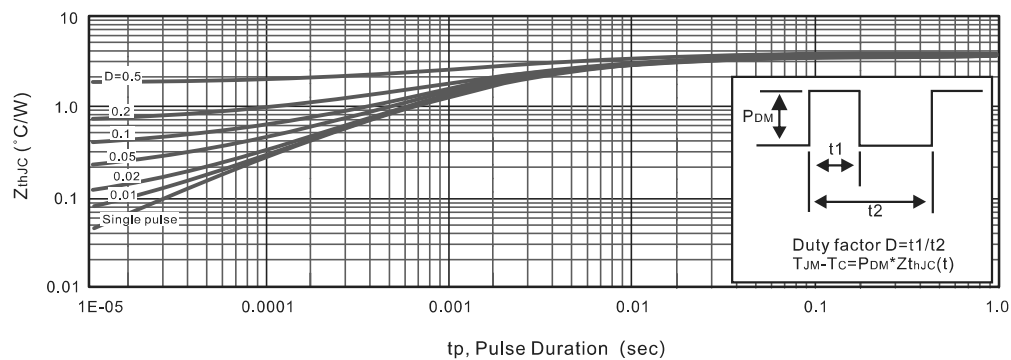
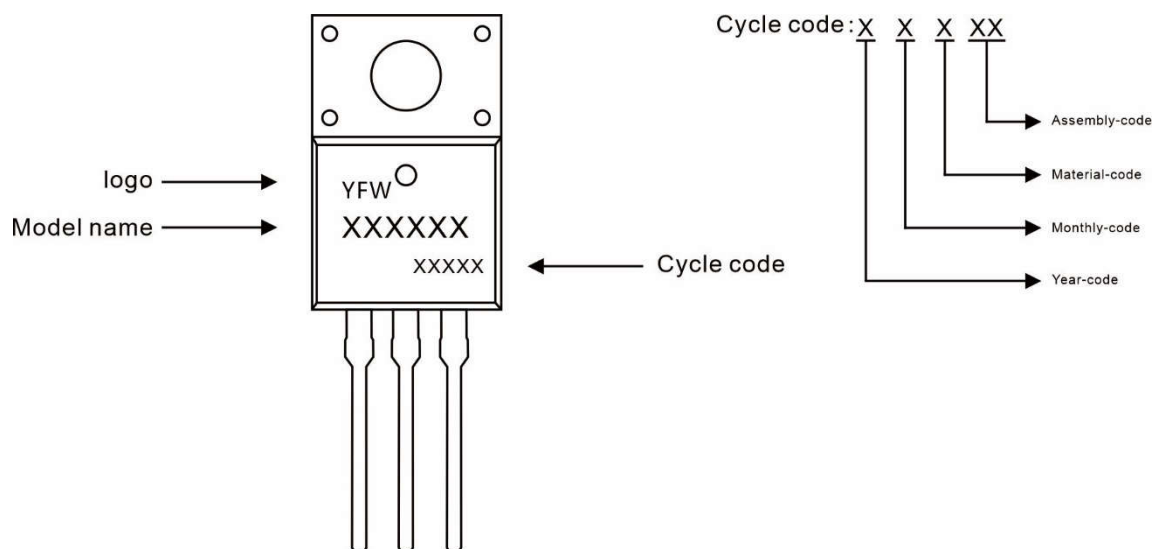


Fig.12 Max. Transient Thermal Impedance



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW80R250AF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220F

Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.66	2.86	0.105	0.113
b	0.75	0.85	0.030	0.033
b1	1.24	1.44	0.049	0.057
c	0.40	0.60	0.016	0.024
D	10.00	10.32	0.394	0.406
E	15.75	16.05	0.620	0.632
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	3.10	3.5	0.122	0.138
L	13.50	13.90	0.531	0.547
L1	2.90	3.30	0.114	0.130
Φ	3.10	3.30	0.122	0.130

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