

100V N-Channel Advanced Power MOSFET

MAIN CHARACTERISTICS

I_D	50A
V_{DSS}	100V
R_{DS(on)-typ(@V_{GS}=10V)}	<20mΩ(Typ:14mΩ)

Features

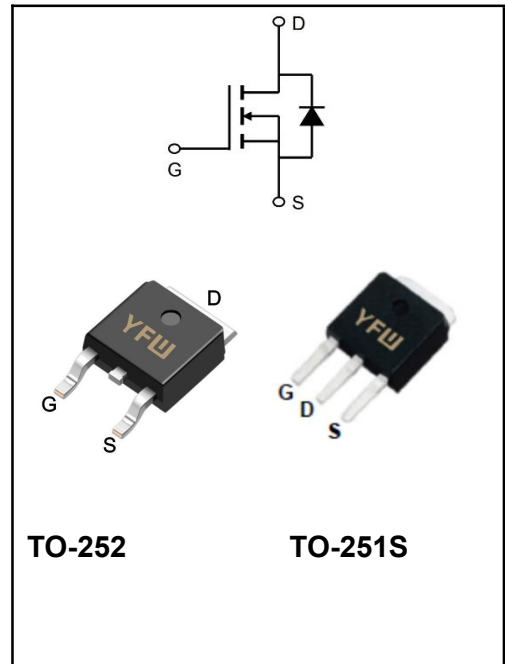
- ◆ **YFW-SGT technology**
- ◆ Ultra-Low RDS(ON)
- ◆ Low Gate Charge
- ◆ High Current Capability

Application

- ◆ Power Management in Telecom., Industrial Automation
- ◆ Motor Driving in Power Tool, E-vehicle, Robotics
- ◆ Current Switching in DC/DC&AC/DC(SR) Sub-systems

MECHANICAL DATA

- ◆ Case: Molded plastic
- ◆ Mounting Position: Any
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆ Lead free in compliance with EU RoHS 2011/65/EU directive
- ◆ Solder bath temperature 275°C maximum, 10s per JESD 22-B106



Maximum Ratings at Tc=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	50	A
Pulsed Drain Current (Note1)	I_{DM}	200	A
Power Dissipation	P_D	82	W
Single Pulse Avalanche Energy ⁵⁾	E_{AS}	74	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +150	°C
Thermal Resistance, Junction-case(Note 2)	R_{θJC}	1.5	°C/W
Thermal Resistance, Junction-ambient	R_{θJA}	39	°C/W

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
	$V_{DS}=100V, T_C=125^\circ C$		-	-	100	μA
Gate Leakage Current	$V_{GS} = \pm 20 V, V_{DS} = 0 V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	-	2.2	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	-	14	20	m Ω
	$V_{GS}=4.5V, I_D=15A$		-	18.6	25	
Input Capacitance	$V_{GS}=0V$	C_{iss}	-	992	-	pF
Output Capacitance	$V_{DS}=50V$	C_{oss}	-	330	-	
Reverse Transfer Capacitance	$f=1MHz$	C_{rss}	-	19.2	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=50V$ $R_G=6.2\Omega$ $I_D=20A$	$t_{d(on)}$	-	7	-	ns
Rise Time		T_r	-	18	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	21	-	
Fall Time		t_f	-	9	-	
Total Gate Charge	$I_D=20A$ $V_{DS}=50V$ $V_{GS}=10V$	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	4	-	
Gate-Drain Charge		Q_{gd}	-	5	-	
Maximun Body-Diode Continuous Current (Note 2)		I_S	-	-	50	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	200	A
Drain-Source Diode Forward Voltage	$I_S=20A$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=20A, V_{GS} = 0 V,$ $di / dt = 100 A/\mu s$	t_{rr}	-	32	-	ns
Reverse Recovery Charge		Q_{rr}	-	32	-	nC

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

Ratings and Characteristic Curves

Figure 1: Power De-rating

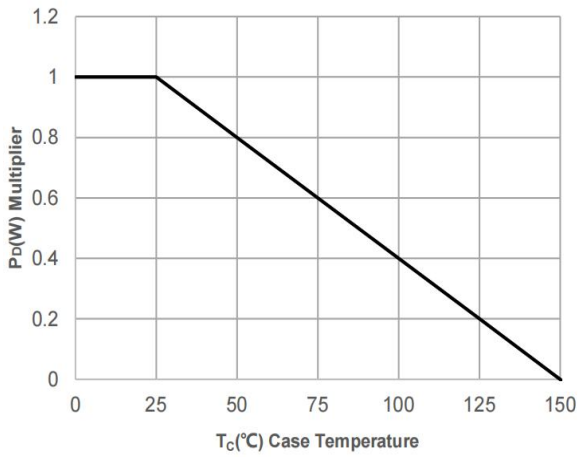


Figure 2: Current De-rating

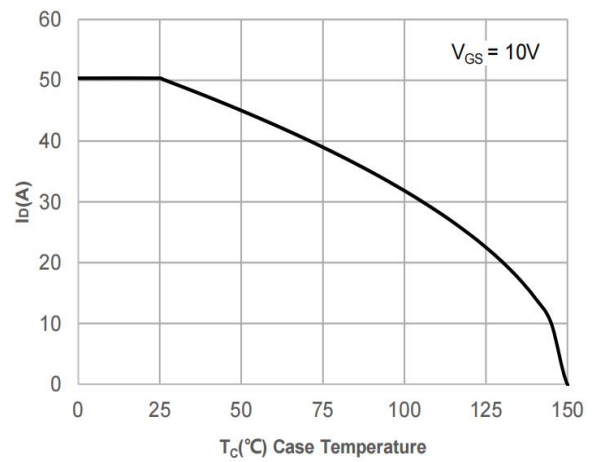


Figure 3: Normalized Maximum Transient Thermal Impedance

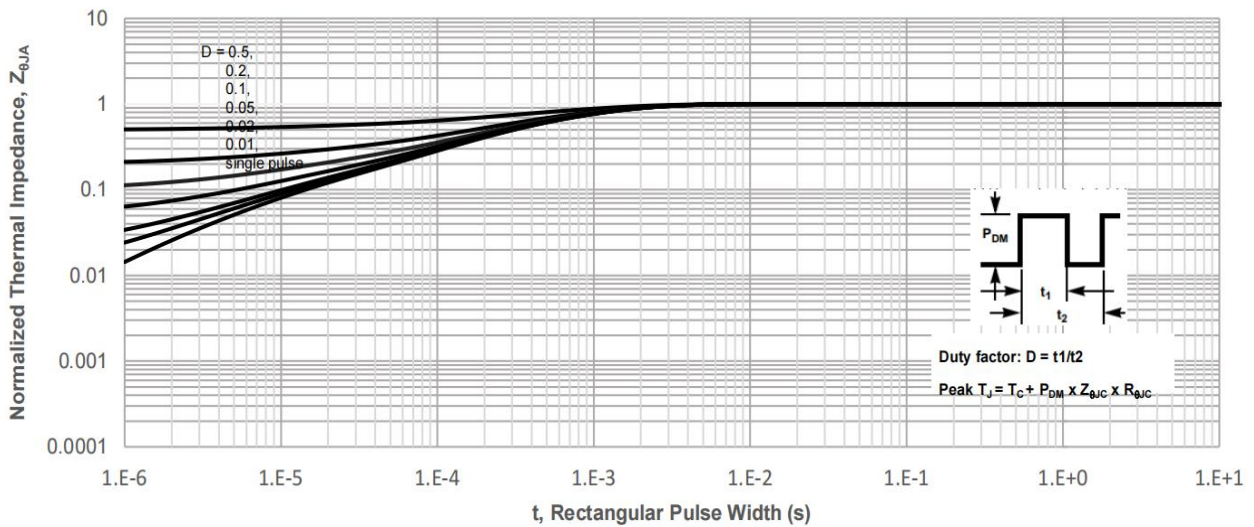
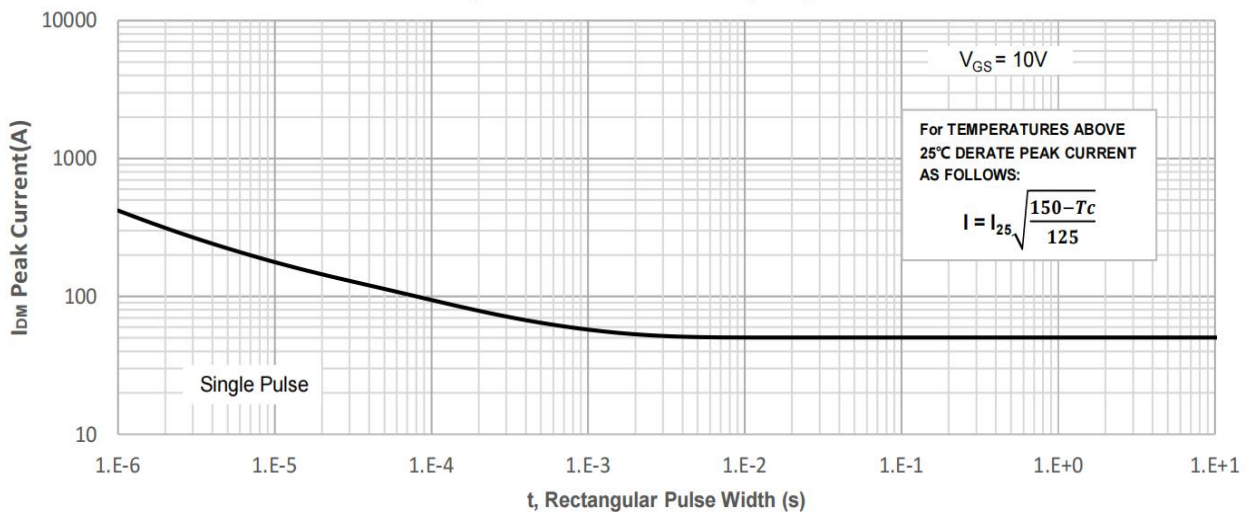


Figure 4: Peak Current Capacity



Ratings and Characteristic Curves

Figure 5: Output Characteristics

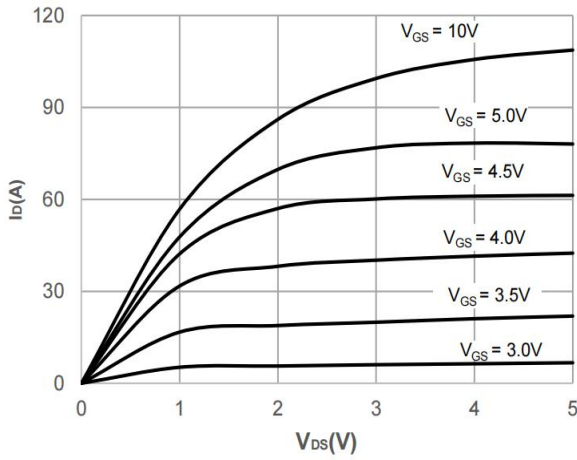


Figure 6: Typical Transfer Characteristics

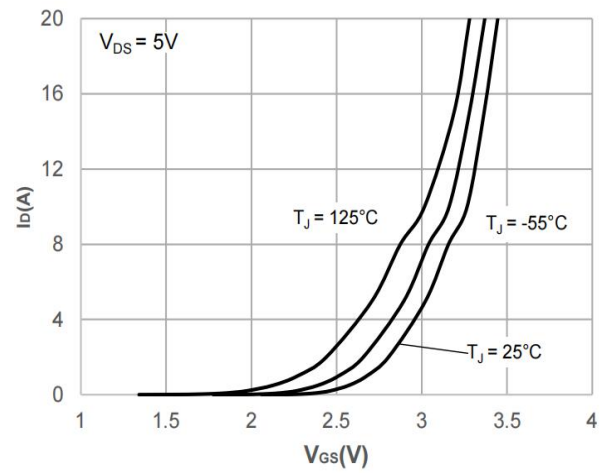


Figure 7: On-resistance vs. Drain Current

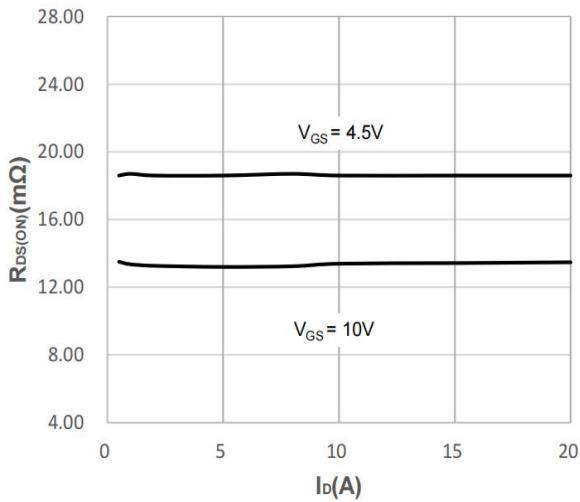


Figure 8: Body Diode Characteristics

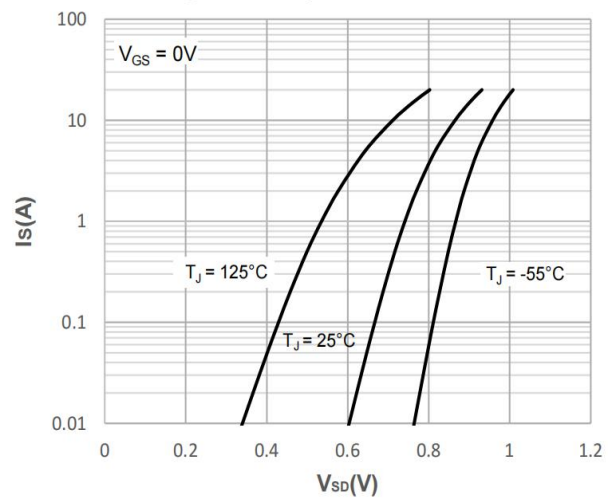


Figure 9: Gate Charge Characteristics

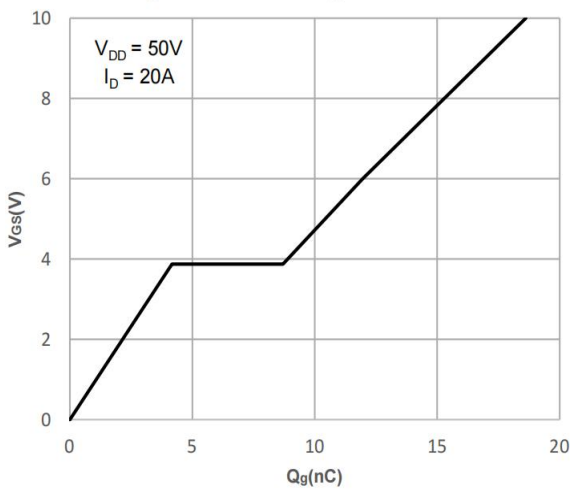
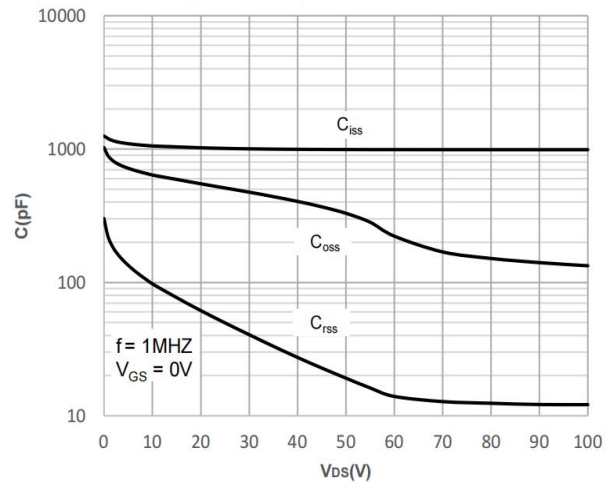


Figure 10: Capacitance Characteristics



Ratings and Characteristic Curves

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

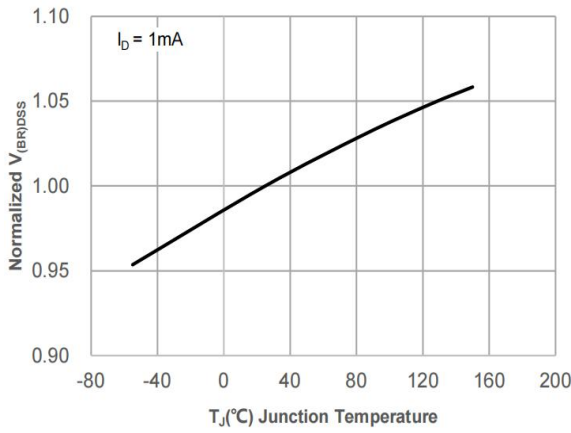


Figure 12: Normalized on Resistance vs. Junction Temperature

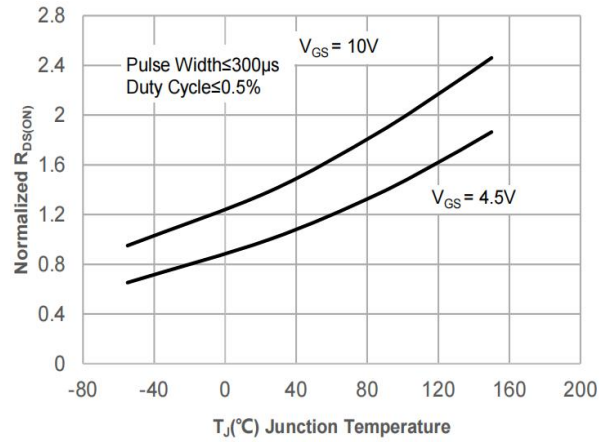


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

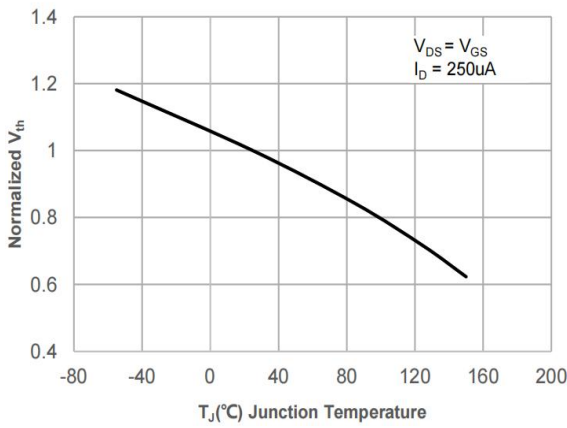


Figure 14: R_DS(ON) vs. V_GS

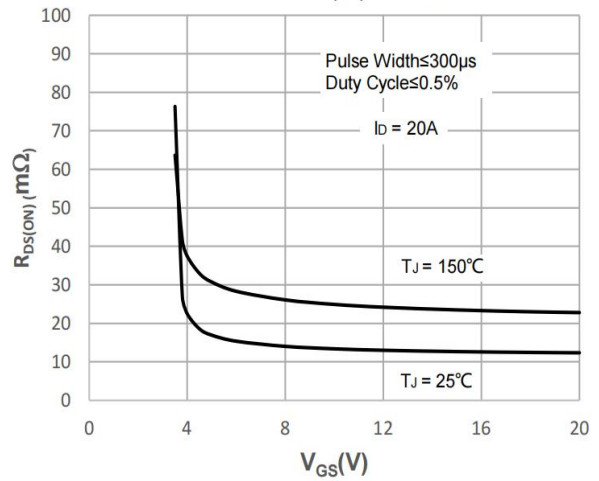
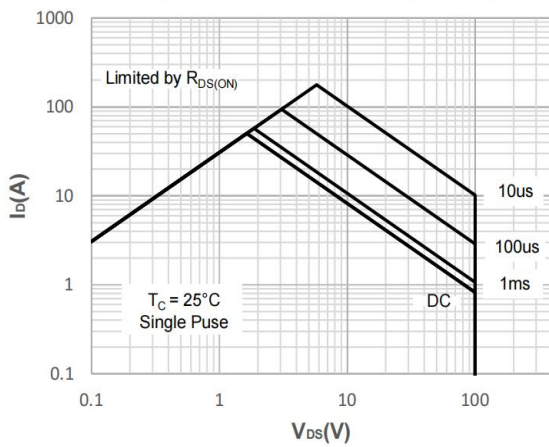
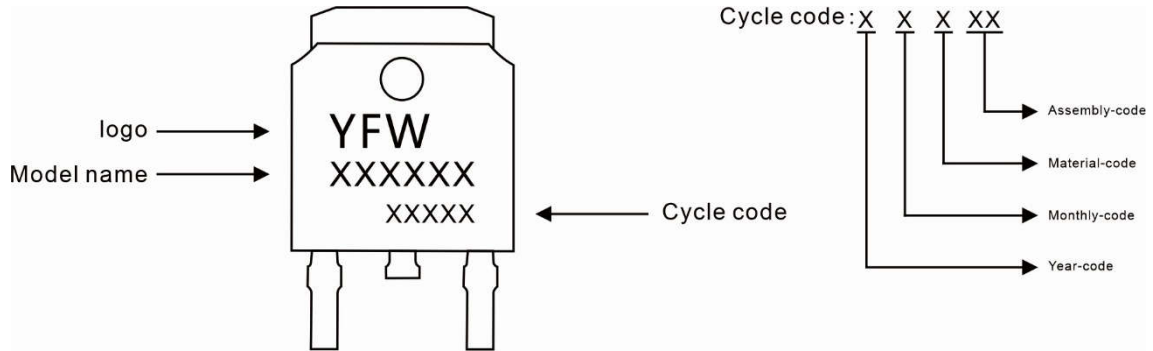


Figure 15: Maximum Safe Operating Area



Marking Diagram



Ordering information

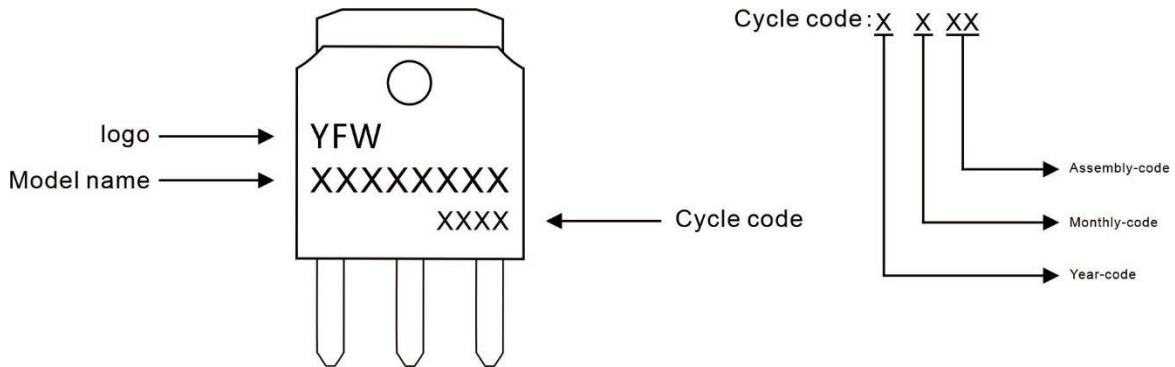
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG50N10AD	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.40	5.70	0.213	0.224
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG50N10AMJ	TO-251S	0.011oz(0.32g)	80pcs/tube	4000pcs/box 24000pcs/Carton

Package Dimensions

TO-251S

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.1	2.5	0.083	0.098
A1	6.3	6.9	0.248	0.271
A2	0.9	1.1	0.035	0.043
A3	TYP0.5		TYP0.019	
b	0.6	0.8	0.024	0.031
c	0.4	0.5	0.015	0.020
D	5.3	5.5	0.209	0.217
D2	3.65	4.05	0.144	0.159
E	5.8	6.4	0.228	0.252
E2	0.9	1.4	0.035	0.055
e	TYP2.29		TYP0.090	
e1	TYP4.58		TYP0.180	
L	3.7	4.3	0.146	0.169

Disclaimer

The information presented in this document is for reference only. Guangdong Youfeng Microelectronics Co.,Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise. The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), YFW or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale. This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <https://www.yfwdiode.com>, or consult YFW sales office for further assistance.