

**600V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

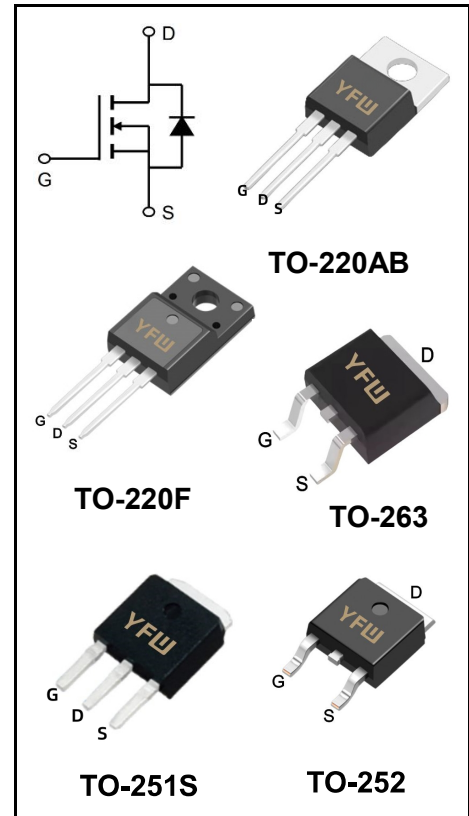
$I_D$	6A
$V_{DSS}$	600V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<1.7Ω (Type: 1.4 Ω)

**Features**

- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆100% Single Pulse avalanche energy Test
- ◆LeadfreeincomplywithEURoHS2011/65/EUdirectives

**Mechanical Data**

- ◆Case: Molded plastic
- ◆Mounting Position: Any
- ◆Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆Solder bath temperature 275°C maximum, 10s per JESD22-106



**Maximum Ratings at Tc=25°C Unless Otherwise Specified**

Characteristics	Symbols	Value			Units
		220AB/263	220F	251/252	
Drain-Source Voltage	$V_{DS}$	600			V
Gate-Source Voltage	$V_{GS}$	±30			V
Continue Drain Current	$I_D$	6			A
- Continuous(Tc=100°C)		4			
Pulsed Drain Current (Note1)	$I_{DM}$	24			A
Power Dissipation	$P_D$	85	22	75	W
-Derate above 25°C		0.63	0.32	0.64	
Single Pulse Avalanche Energy (Note2)	$E_{AS}$	320			mJ
Avalanche Current (Note 1)	$I_{AR}$	6			A
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	11			mJ
Operating Temperature Range	$T_J$	150			°C
Storage Temperature Range	$T_{STG}$	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	5.7	1.7	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	100	°C/W

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	600	-	-	V
Breakdown Voltage Temperature Coefficient	$I_D = 250 \mu A$ (Referenced to 25°C)	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	-	0.5	-	V/°C
Drain-Source Leakage Current	$V_{DS} = 600 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	1	uA
	$V_{DS} = 480 V, T_c = 125^\circ C$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	$I_{GSS}$	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	3	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 3 A$	$R_{DS(on)}$	-	1.4	1.7	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 3 A$	$g_{fs}$	-	3.9	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V,$ $f = 1 MHz$	$C_{iss}$	-	700	-	pF
Output Capacitance		$C_{oss}$	-	28.4	-	
Reverse Transfer Capacitance		$C_{rss}$	-	5.8	-	
Turn-on Delay Time	$I_D = 4 A, V_{DD} = 300 V,$ $R_G = 10 \Omega$ (Note3.4)	$td(ON)$	-	13.9	-	nS
Rise Time		$tr$	-	19.9	-	
Turn-Off Delay Time		$td(OFF)$	-	27.3	-	
Fall Time		$tf$	-	9.1	-	
Total Gate Charge	$I_D = 4 A, V_{DD} = 480 V,$ $V_{GS} = 10 V$ (Note3.4)	$Q_G$	-	11.5	-	nC
Gate to Source Charge		$Q_{GS}$	-	3.6	-	
Gate to Drain Charge		$Q_{GD}$	-	4	-	

**Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified**

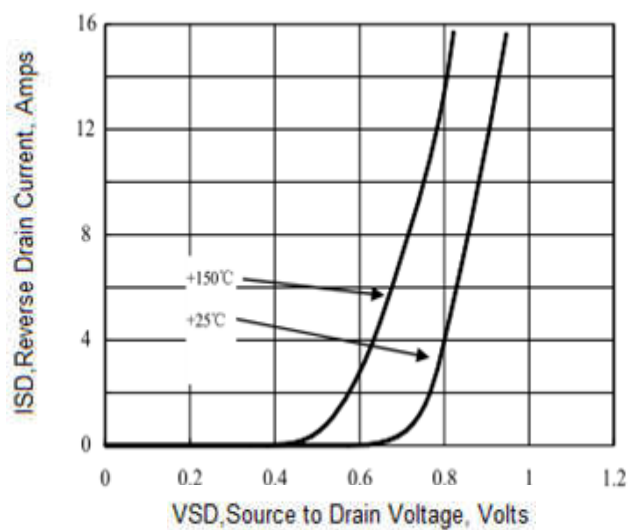
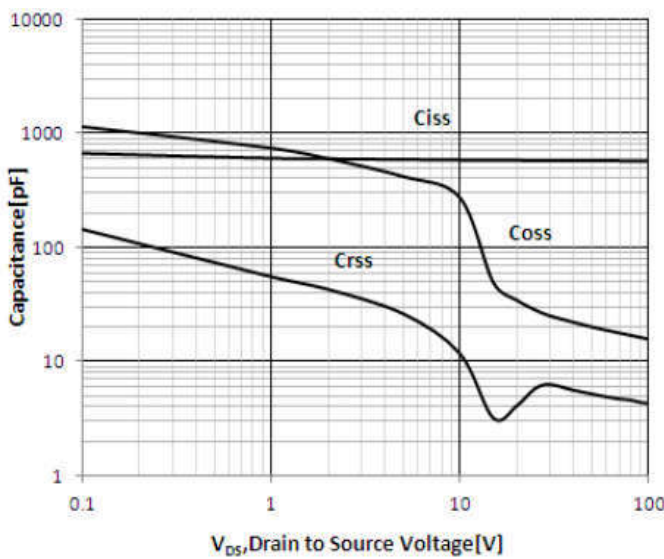
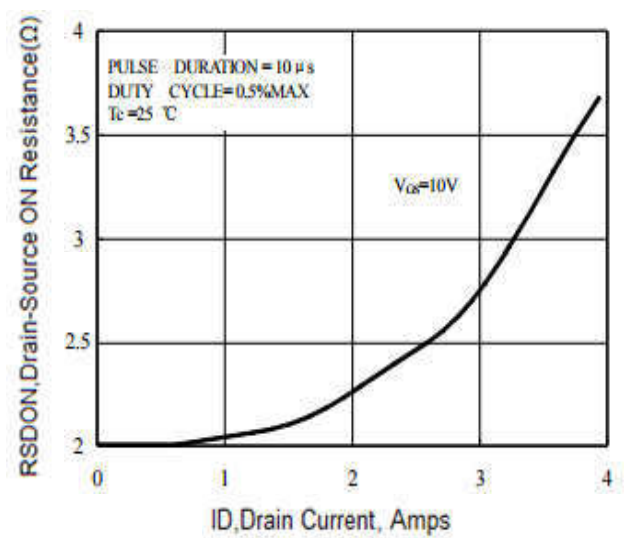
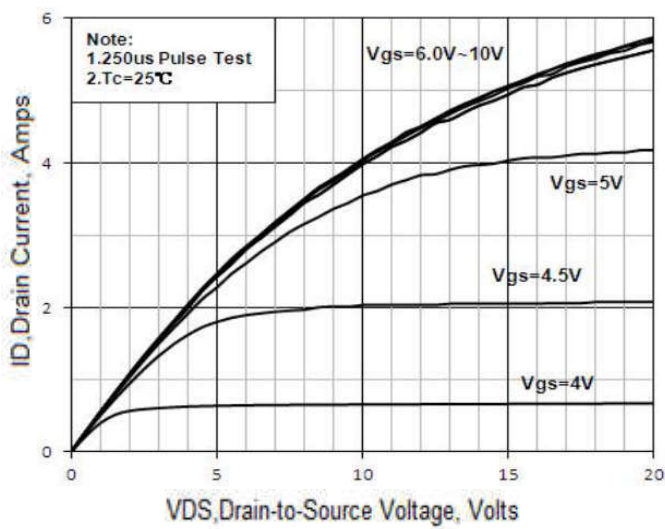
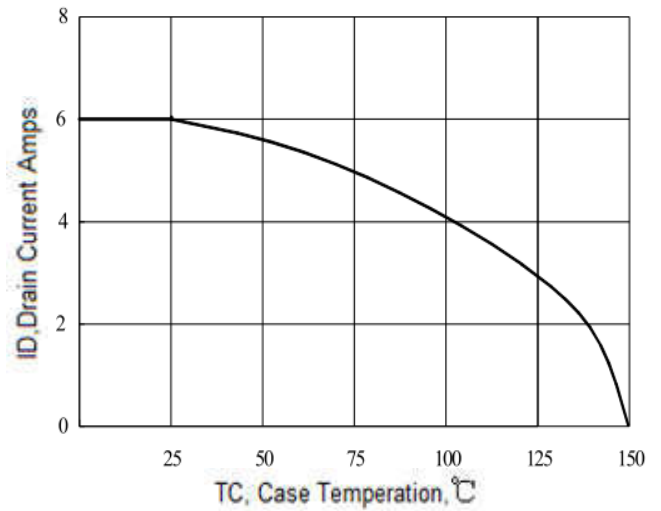
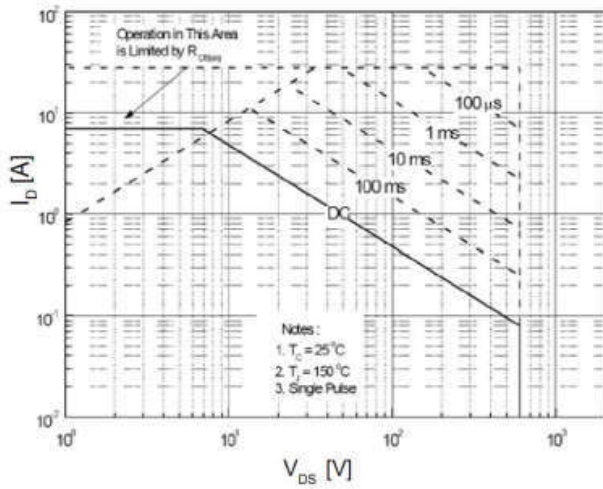
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Body-Diode Continuous Current		<b>I<sub>S</sub></b>	-	-	6	<b>A</b>
Maximum Body-Diode Pulsed Current(Note2)		<b>I<sub>SM</sub></b>	-	-	24	<b>A</b>
Drain-Source Diode Forward Voltage	<b>I<sub>SD</sub> = 4 A</b>	<b>V<sub>SD</sub></b>	-	-	1.5	<b>V</b>
Reverse Recovery Time	<b>I<sub>SD</sub> = 4 A, V<sub>GS</sub> = 0 V, dI<sub>F</sub> / dt = 100 A/μs</b>	<b>trr</b>	-	240	-	<b>nS</b>
Reverse Recovery Charge		<b>Qrr</b>	-	0.9	-	<b>uC</b>

Note:

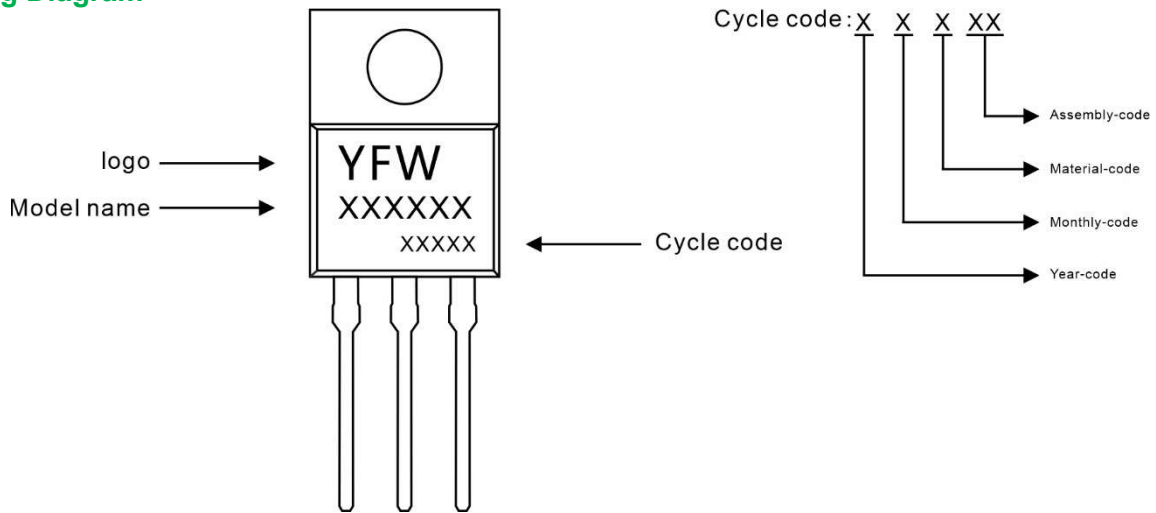
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 6 A, VDD = 50 V, L = 18mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤ 300 μ s, Duty Cycle ≤ 2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves

Maximum Safe Operating Area



**Marking Diagram**



**Ordering information**

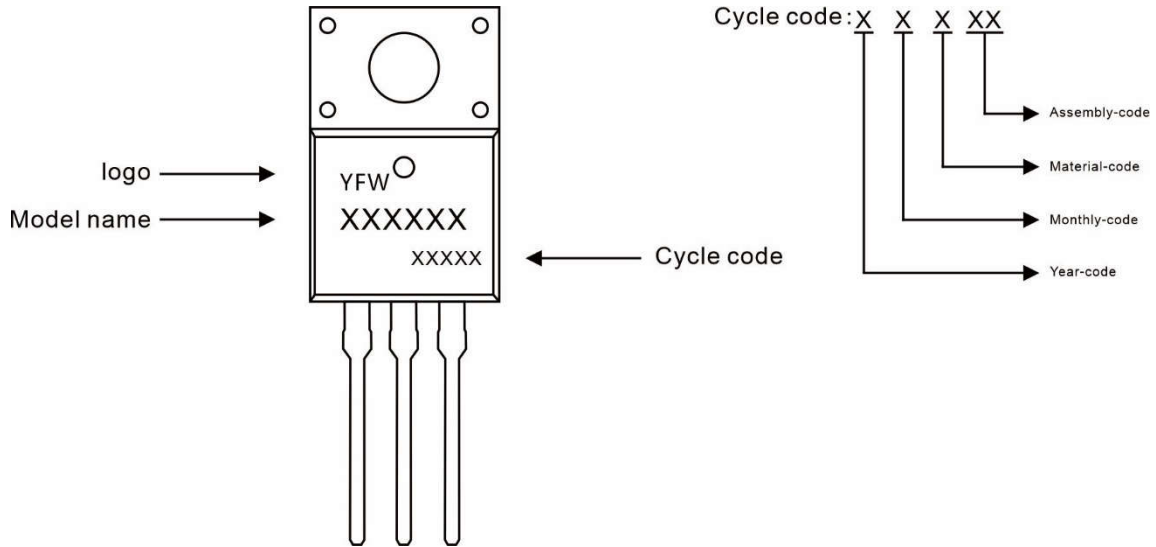
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW6N60AT	TO-220AB	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

**Package Dimensions**

**TO-220AB**

Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156

**Marking Diagram**



**Ordering information**

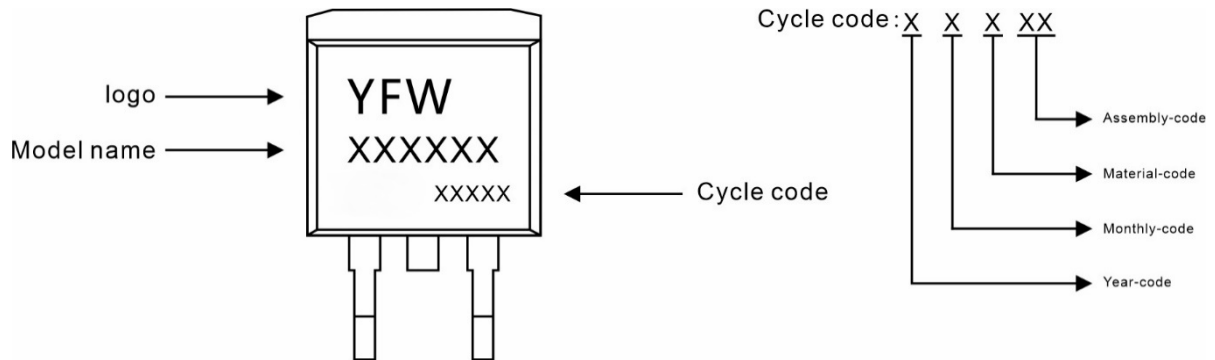
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW6N60AF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

**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

**Marking Diagram**



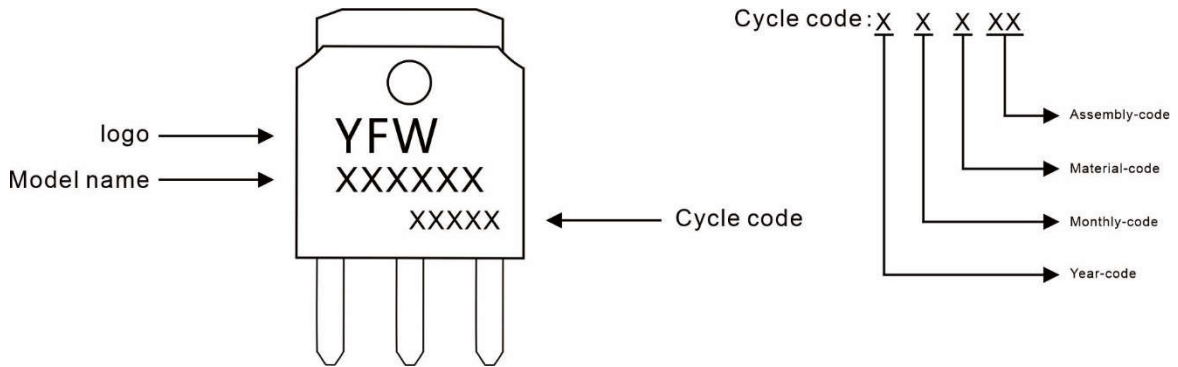
**Ordering information**

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW6N60AS	TO-263	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

**Package Dimensions  
TO-263**

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102
L3	1.60	1.80	0.063	0.071

**Marking Diagram**



**Ordering information**

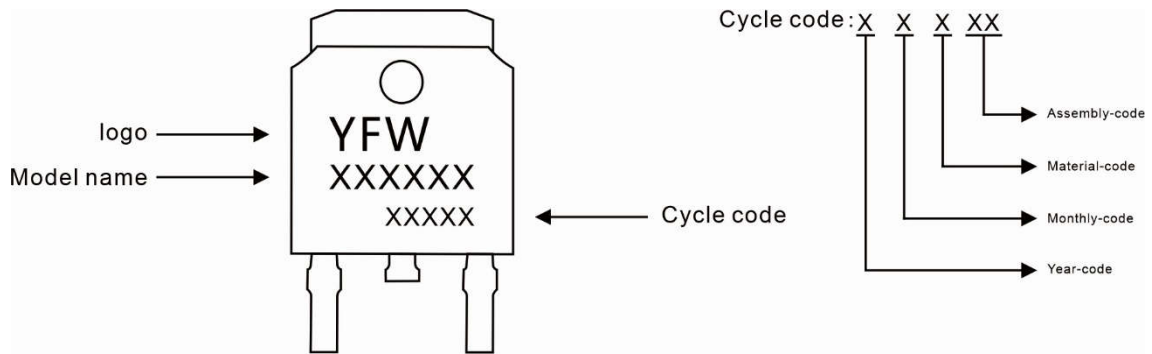
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW6N60AMJ	TO-251S	0.011oz(0.32g)	80pcs/tube	4000pcs/box 24000pcs/Carton

**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

**Marking Diagram**



**Ordering information**

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW6N60AD	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

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