

250V N- Channel Advanced Power MOSFET

MAIN CHARACTERISTICS

I_D	40A
V_{DSS}	250V
R_{DS(on)-typ}(@V_{GS}=10V)	< 100mΩ (Typ:79mΩ)

FEATURES

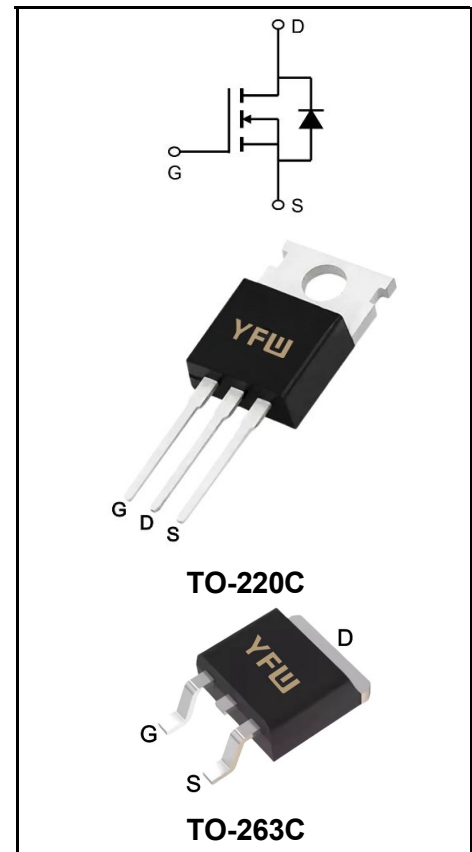
- ♦ Proprietary New Planar Technology
- ♦ Low Gate Charge Minimize Switching Loss
- ♦ Fast Recovery Body Diode

APPLICATIONS

- ♦ DC-DC Converters
- ♦ DC-AC Inverters for UPS
- ♦ SMPS and Motor controls

MECHANICAL DATA

- ♦ Case: TO-220C/AC TO-263C/ASC
- ♦ 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 T_c=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	250	V
Gate-Source Voltage	V _{GS}	±20	V
Continue Drain Current	I _D	40	A
Pulsed Drain Current (Note1)	I _{DM}	160	A
Power Dissipation	P _D	125	W
Single Pulse Avalanche Energy	E _{AS}	1250	mJ
Operating Temperature Range	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case (Note2)	R _{θJC}	1	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62	°C/W

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	250	-	-	V
Drain-Source Leakage Current	$V_{DS} = 250\text{V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{A}$	$R_{DS(on)}$	-	79	100	m Ω
Input Capacitance	$V_{GS} = 0\text{ V},$ $V_{DS} = 25\text{ V}$ $f=1\text{ MHz}$	C_{iss}	-	2500	-	pF
Output Capacitance		C_{oss}	-	85	-	pF
Reverse Transfer Capacitance		C_{rss}	-	250	-	pF
Turn-on Delay Time	$V_{DS}=100\text{V}$ $I_D=20\text{A}$ $V_{GS}=10\text{V}$ $R_G=3.9\Omega$	$t_{d(ON)}$	-	20	-	ns
Rise Time		t_r	-	30	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	65	-	ns
Fall Time		t_f	-	25	-	ns
Total Gate Charge	$V_{DS}=100\text{V}$ $V_{GS}=10\text{V}$ $I_D=20\text{A}$	Q_G	-	96	-	nC
Gate to Source Charge		Q_{GS}	-	14	-	nC
Gate to Drain Charge		Q_{GD}	-	39	-	nC
Maximun Body-Diode Continuous Current (Note 2)		I_S	-	-	40	A
Maximun Body-Diode Pulsed Curre		I_{SM}	-	-	160	A
Drain-Source Diode Forward Voltage	$I_{SD} = 40\text{A}, V_{GS} = 0\text{V}$	V_{SD}	-	-	1.5	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=20\text{A}, V_{GS} = 0\text{ V},$ $dI / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	260	-	ns
Reverse Recovery Charge		Q_{rr}	-	400	-	μC

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

Ratings and Characteristic Curves

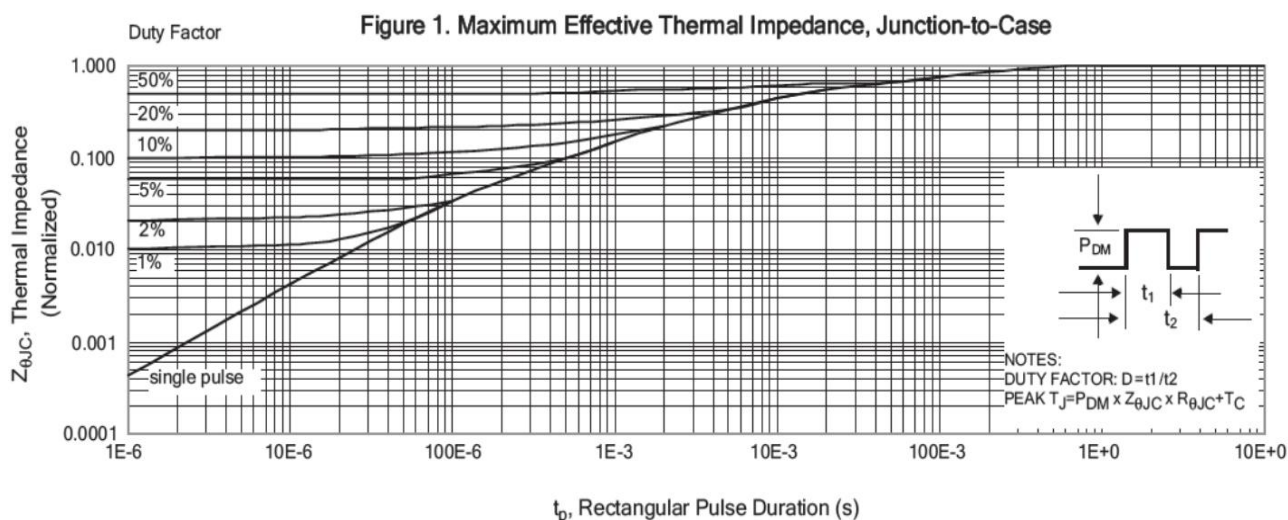


Figure 2. Maximum Power Dissipation vs Case Temperature

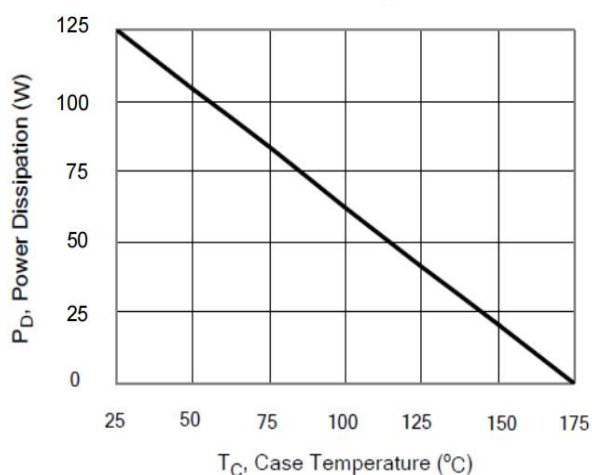


Figure3. Maximum Continuous Drain Current vs Case Temperature

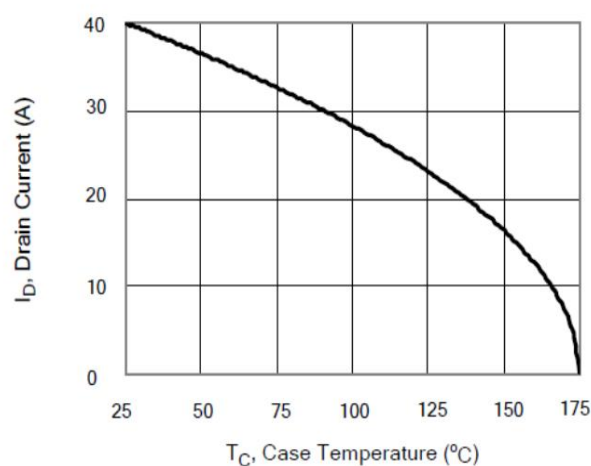


Figure 4. Typical Output Characteristics

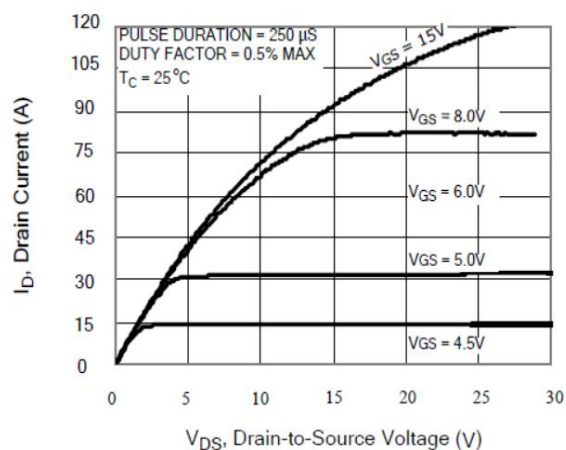
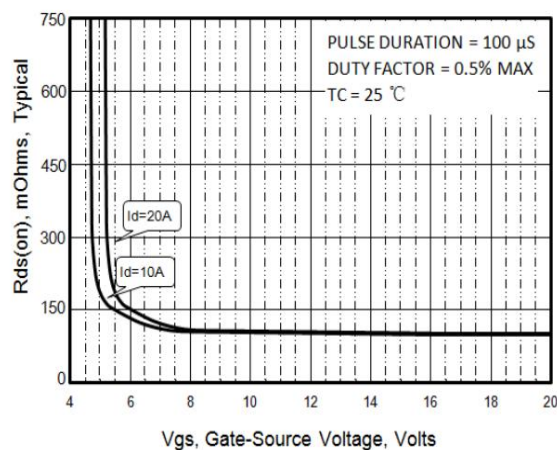


Figure 5. $R_{ds(on)}$ vs Gate Voltage



Ratings and Characteristic Curves

Figure 6. Maximum Peak Current Capability

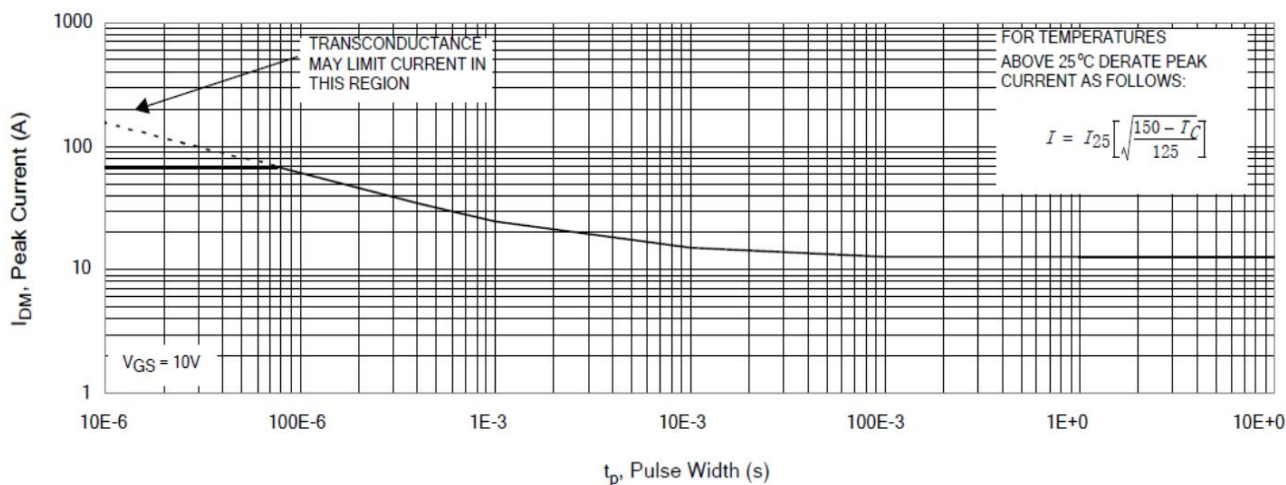


Figure 7. Typical Transfer Characteristics

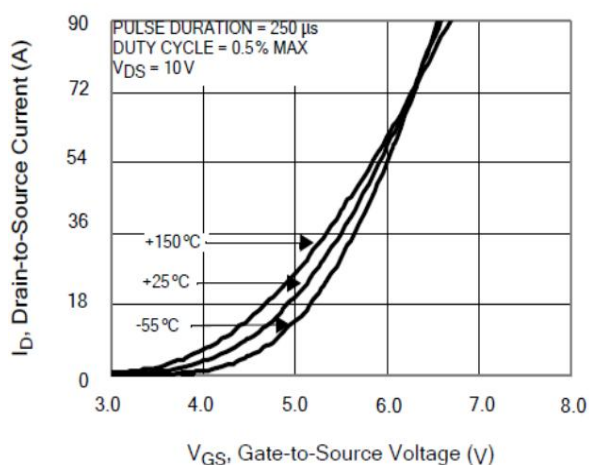


Figure 8. Unclamped Inductive Switching Capability

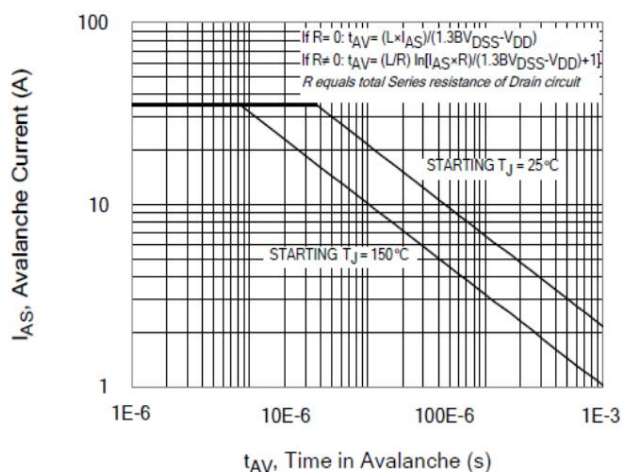


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

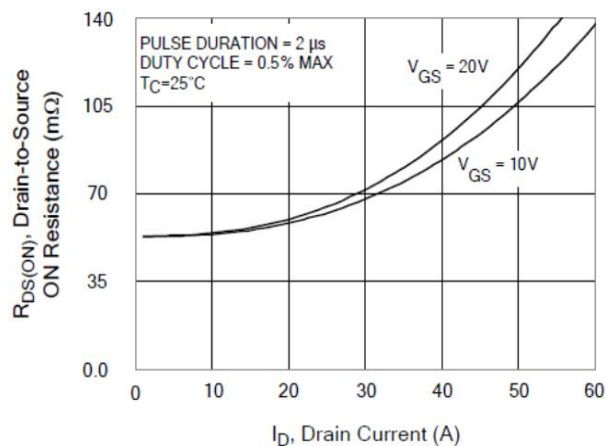
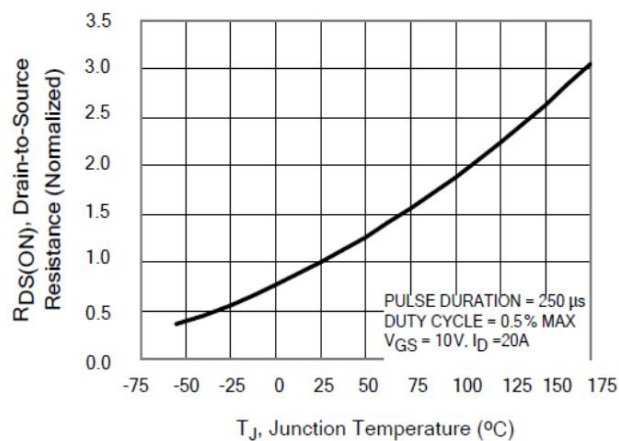


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



Ratings and Characteristic Curves

Figure 11. Typical Breakdown Voltage vs Junction Temperature

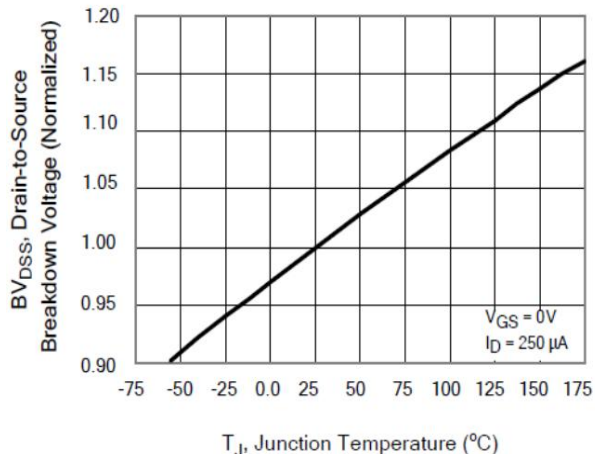


Figure 12. Typical Threshold Voltage vs Junction Temperature

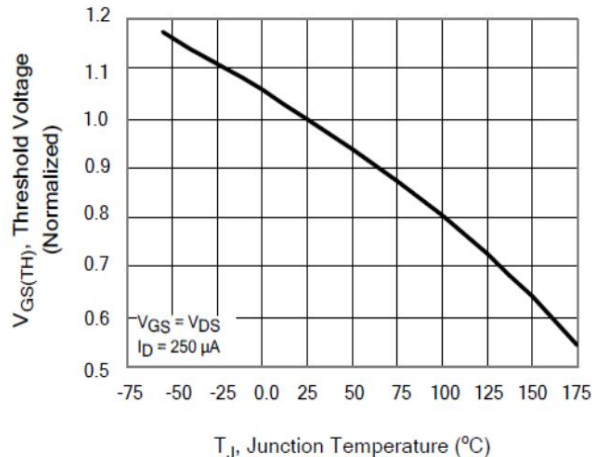


Figure 13. Maximum Safe Operating Area

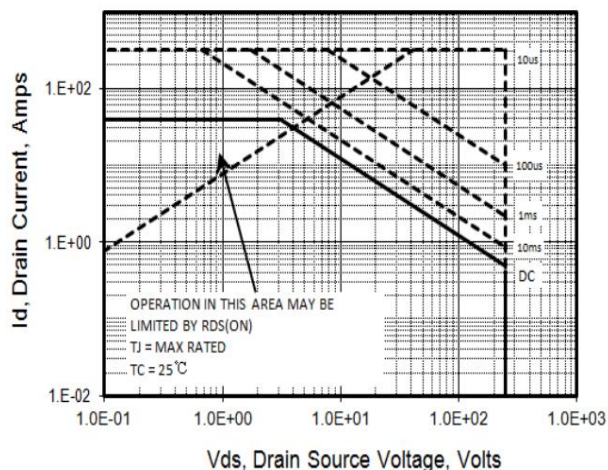


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

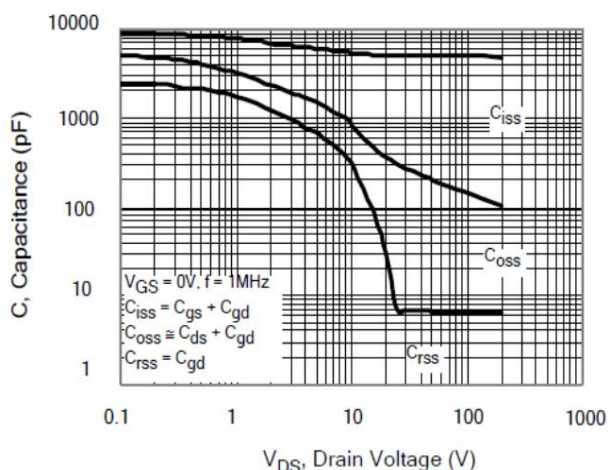


Figure 15. Typical Gate Charge

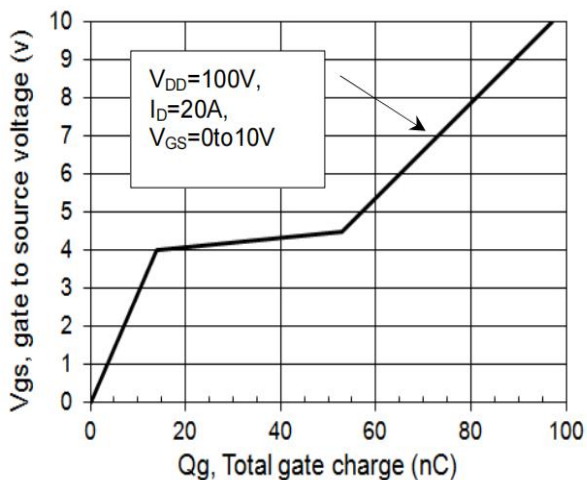
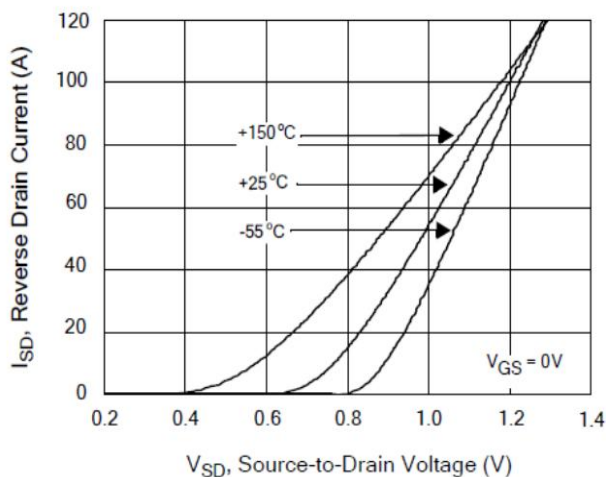
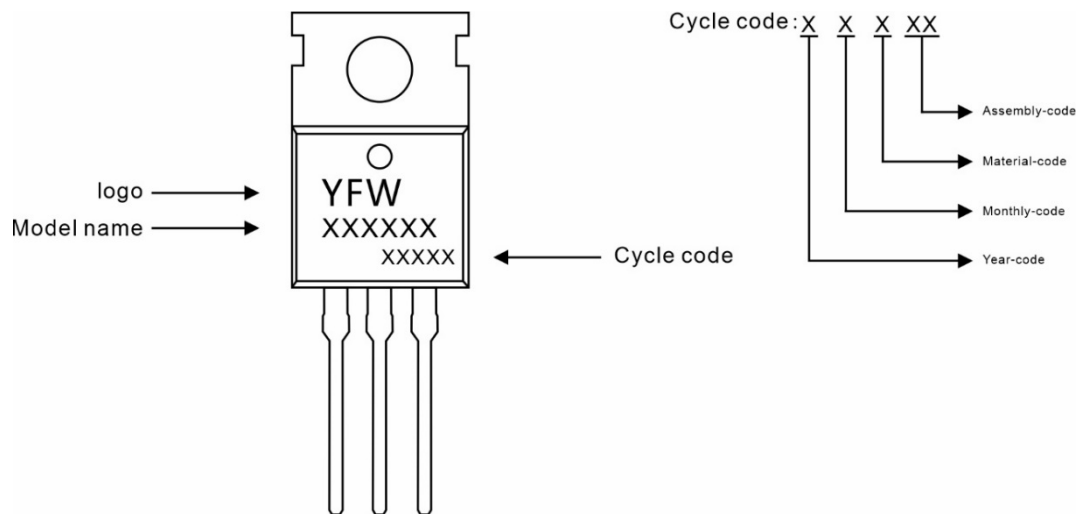


Figure 16. Typical Body Diode Transfer Characteristics



Marking Diagram



Ordering information

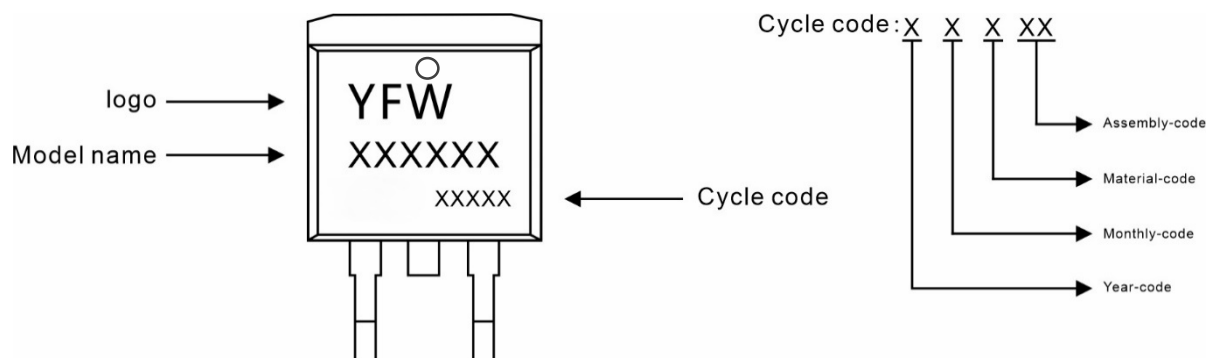
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW40N25AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
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
YFW40N25ASC	TO-263C	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

Package Dimensions

TO-263C

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	9.50	0.335	0.374
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.20	15.80	0.598	0.622
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

Disclaimer

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