

250V N- Channel Advanced Power MOSFET

MAIN CHARACTERISTICS

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

FEATURES

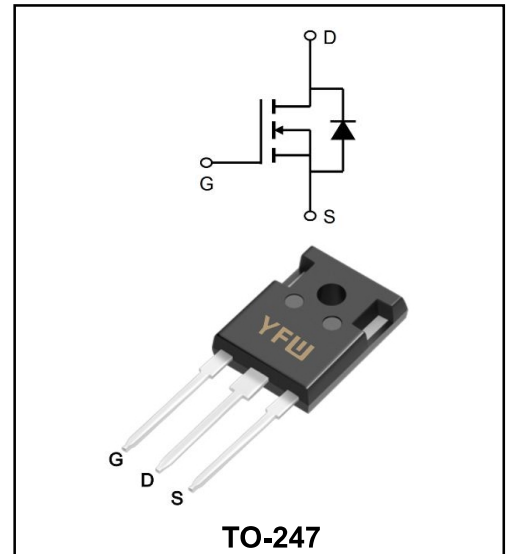
- ♦ Proprietary New Planar Technology
- ♦ Low Gate Charge Minimize Switching Loss
- ♦ Fast Recovery Body Diode

APPLICATIONS

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

MECHANICAL DATA

- ♦ Case: TO-247/AP
- ♦ 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	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)	$R_{\theta JC}$	1	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	°C/W

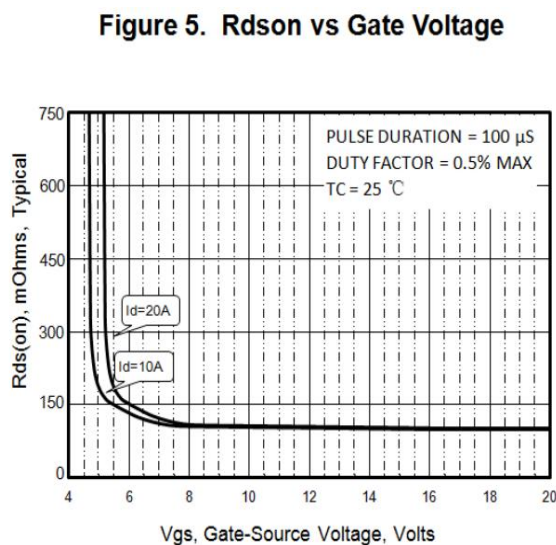
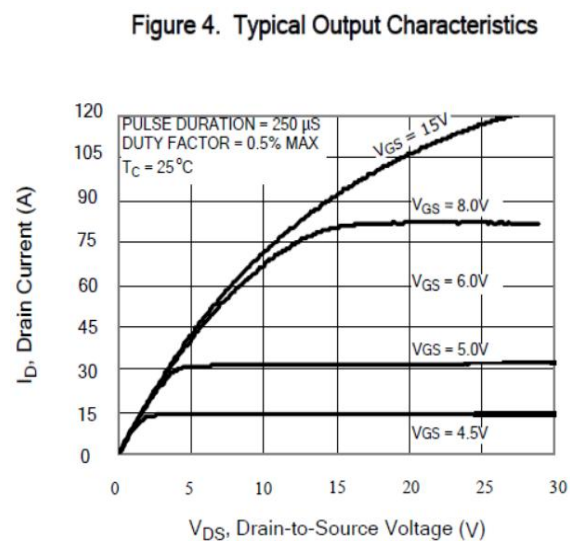
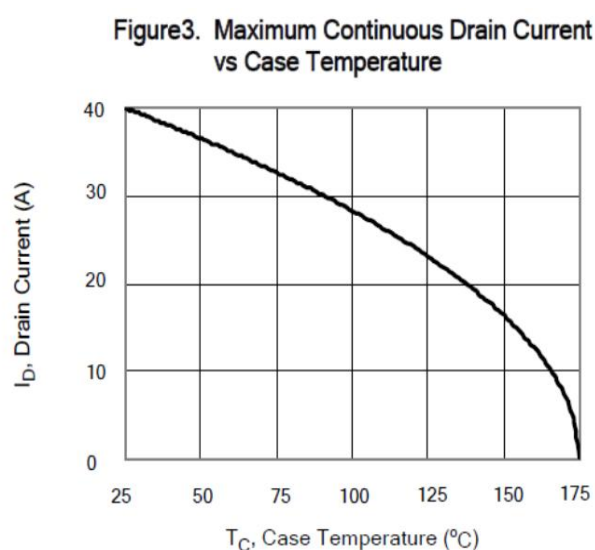
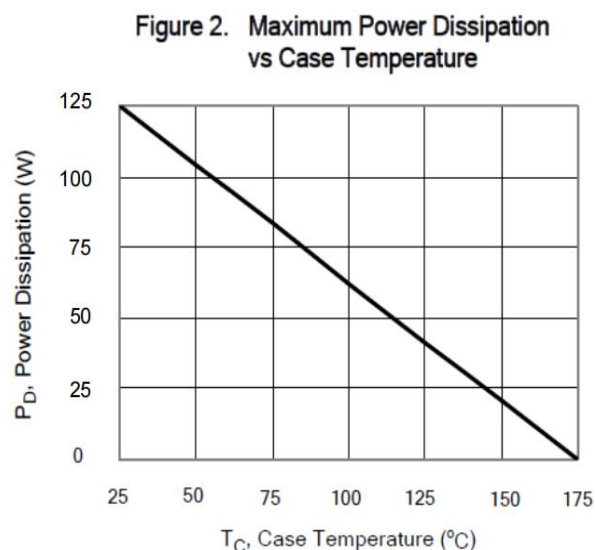
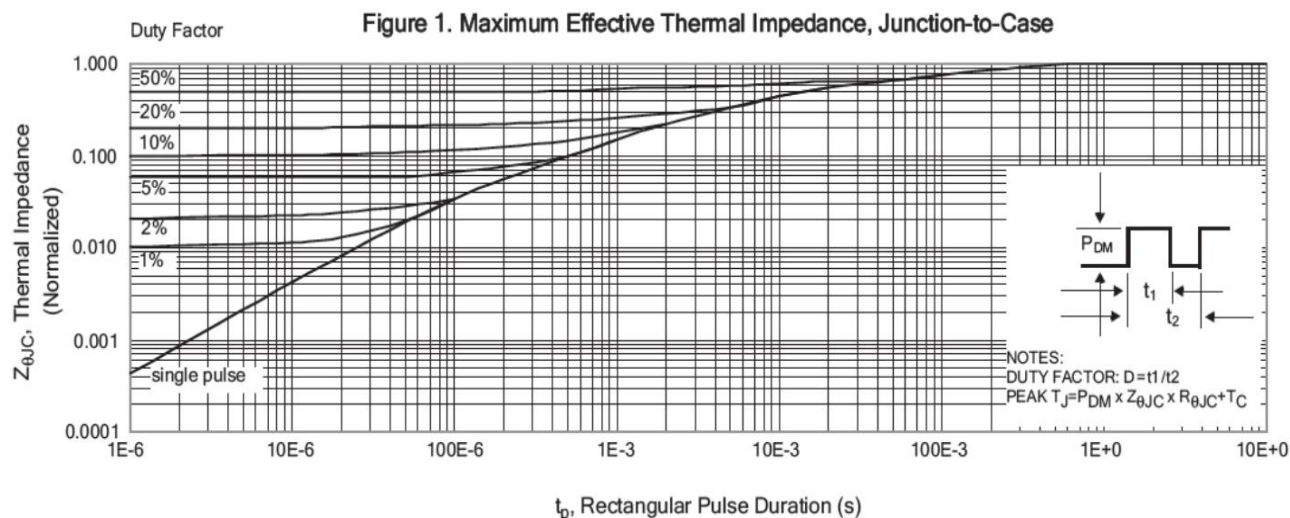
Note1: Pulse test: 300 μ s pulse width, 2 % duty cycle

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



Ratings and Characteristic Curves

Figure 6. Maximum Peak Current Capability

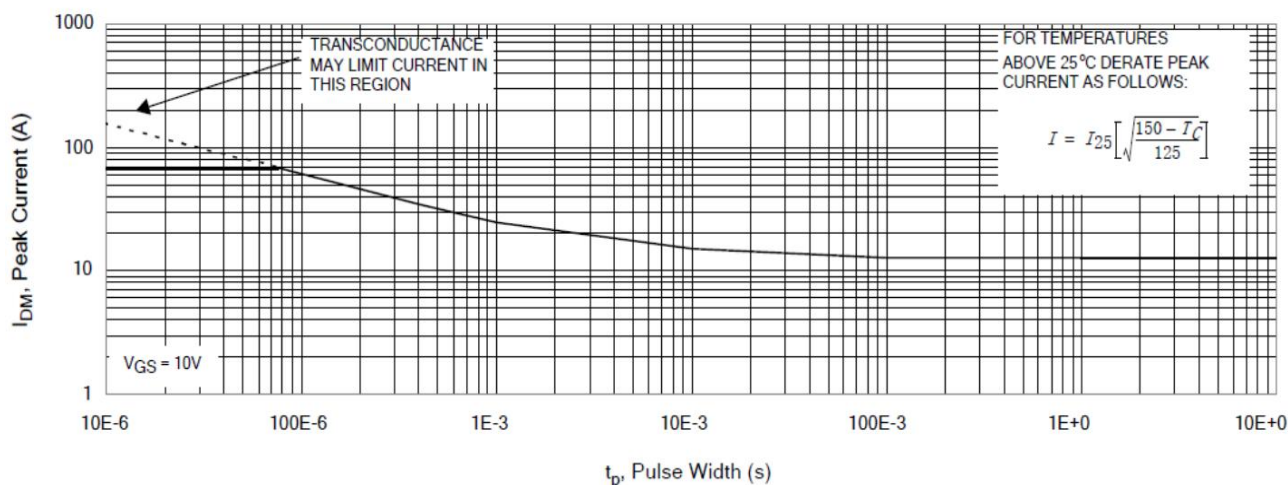


Figure 7. Typical Transfer Characteristics

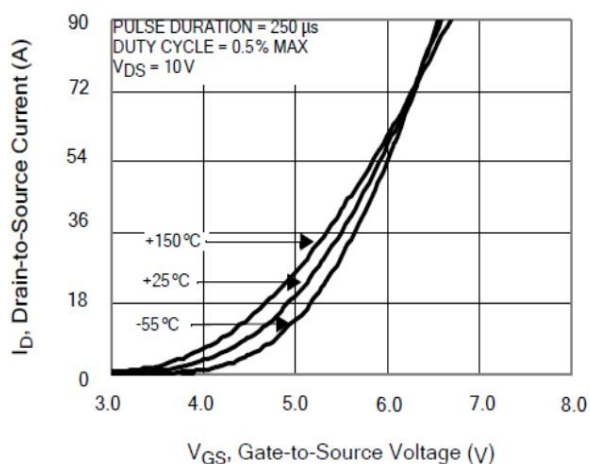


Figure 8. Unclamped Inductive Switching Capability

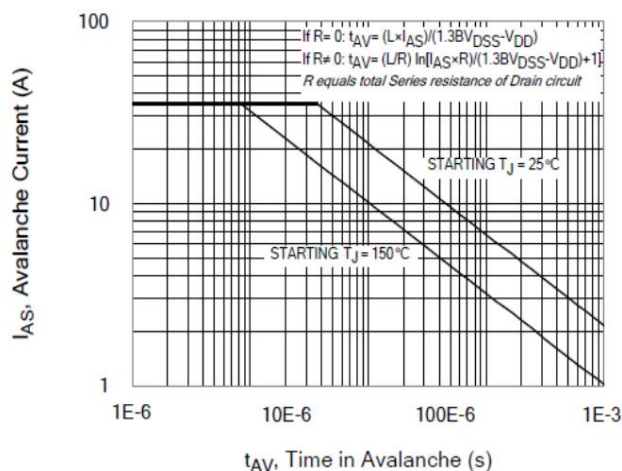


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

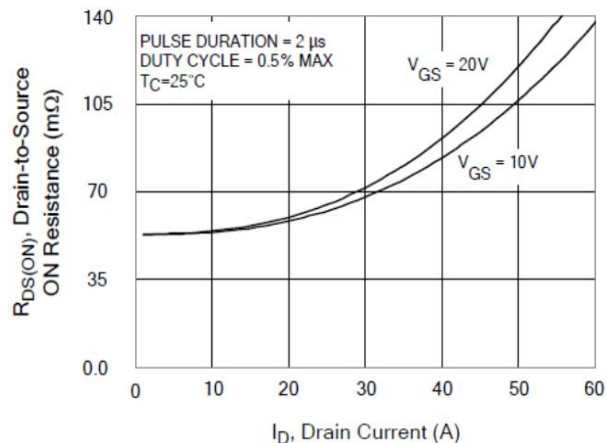
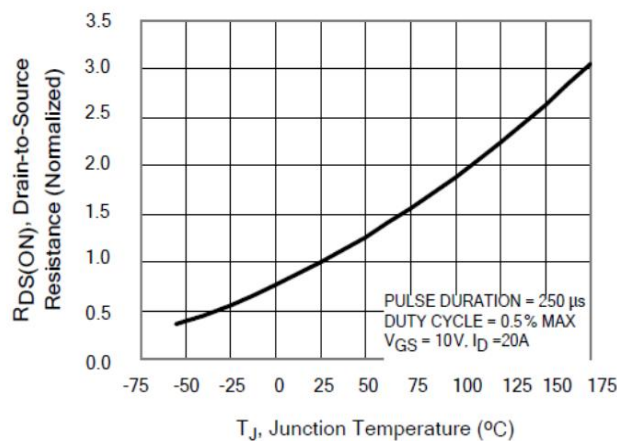


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



Ratings and Characteristic Curves

Figure 11. Typical Breakdown Voltage vs Junction Temperature

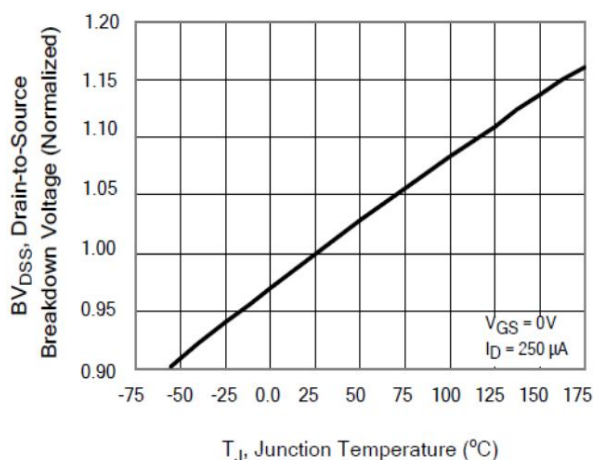


Figure 12. Typical Threshold Voltage vs Junction Temperature

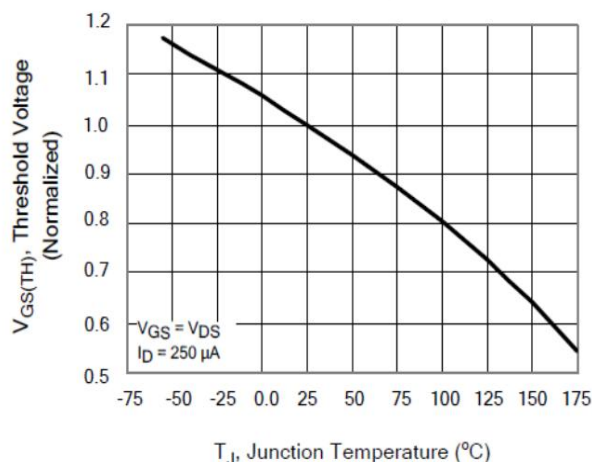


Figure 13. Maximum Safe Operating Area

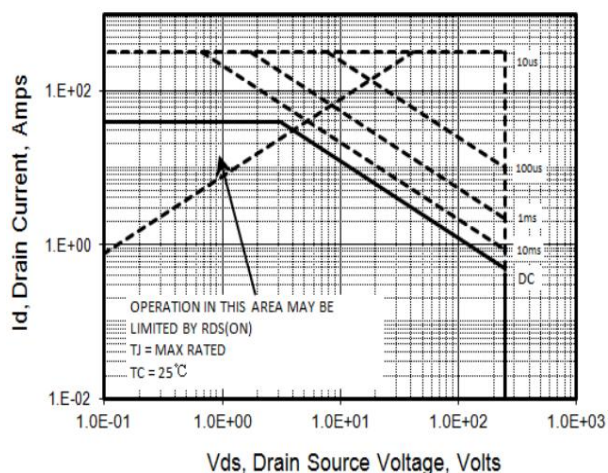


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

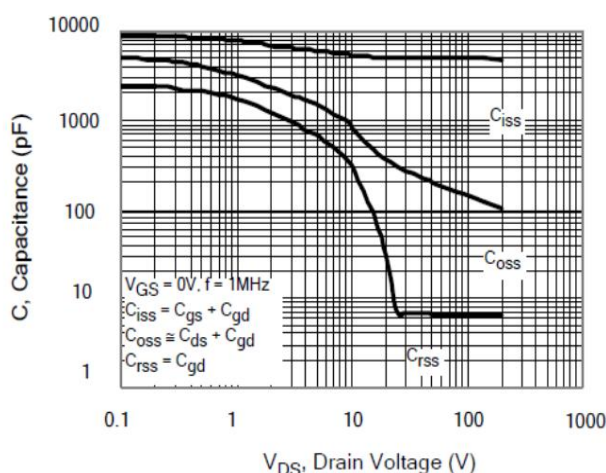


Figure 15. Typical Gate Charge

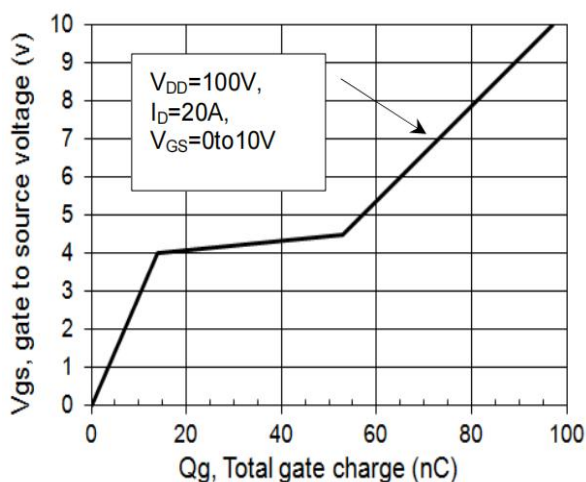
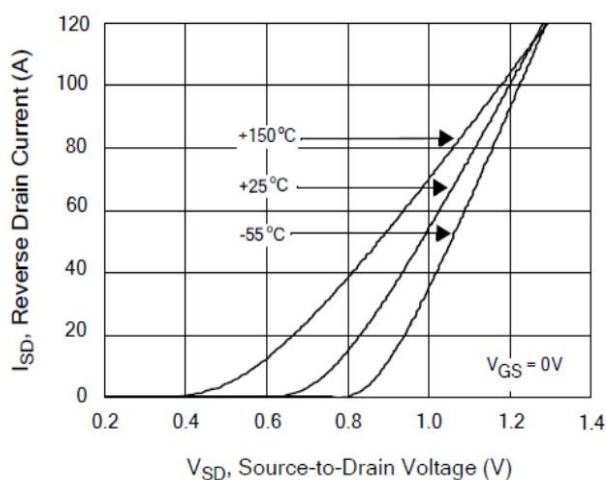
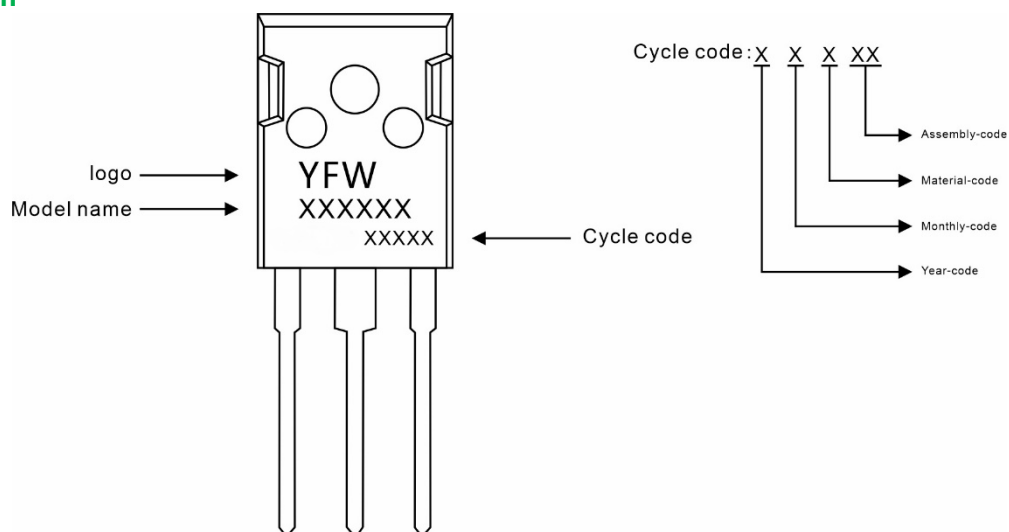


Figure 16. Typical Body Diode Transfer Characteristics



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW40N25AP	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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