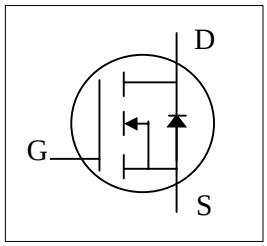
AP80N03GS/P-HF

Halogen-Free Product

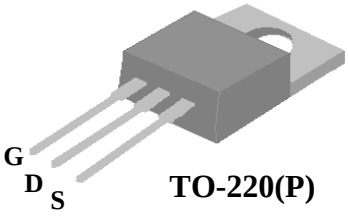
Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

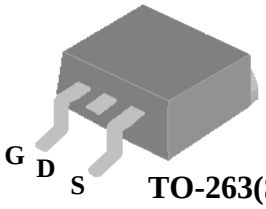
- ▼ **Low On-Resistance**
- ▼ **Fast Switching Characteristic**
- ▼ **Simple Drive Requirement**
- ▼ **RoHS Compliant & Halogen-Free**



BV_{DSS}	30V
$R_{DS(ON)}$	8mΩ
I_D	80A



TO-220(P)



TO-263(S)

Description

AP80N03 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-263 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance. The through-hole version (AP80N03P) are available for low-profile applications.

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	80	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	50	A
I_{DM}	Pulsed Drain Current[1]	315	A
P_D@T_C=25℃	Total Power Dissipation	83.3	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	1.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	40	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=40A	-	6	8	mΩ
		V_{GS}=4.5V, I_D=32A	-	9	12	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=40A	-	50	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=40A	-	42	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=24V	-	5.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=5V	-	26	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15V	-	9.9	-	ns
t_r	Rise Time	I_D=40A	-	100	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	37	-	ns
t_f	Fall Time	V_{GS}=10V	-	60	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	1950	-	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	895	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	315	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current (Body Diode)	V_D=V_G=0V , V_S=1.3V	-	-	80	A
I_{SM}	Pulsed Source Current (Body Diode)[1]		-	-	315	A
V_{SD}	Forward On Voltage[2]	T_j=25℃, I_S=80A, V_{GS}=0V	-	-	1.3	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board

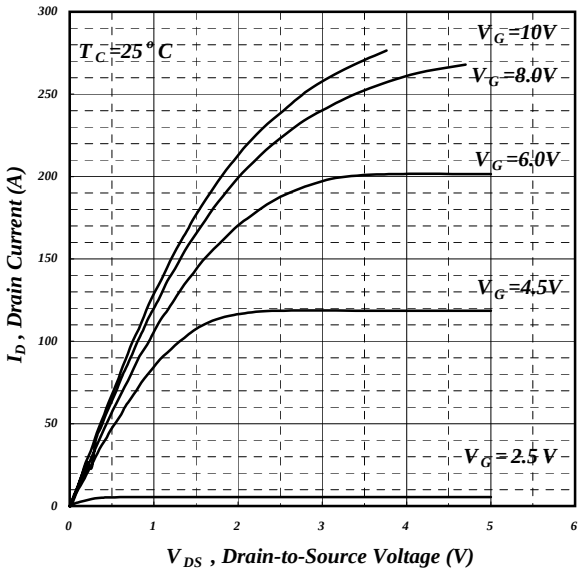


Fig 1. Typical Output Characteristics

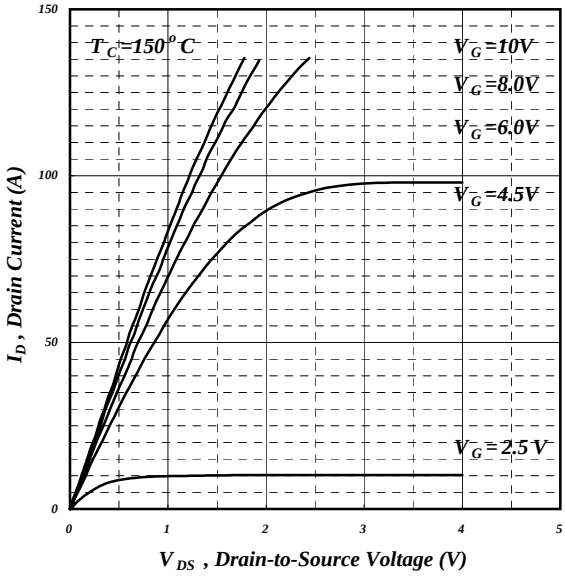


Fig 2. Typical Output Characteristics

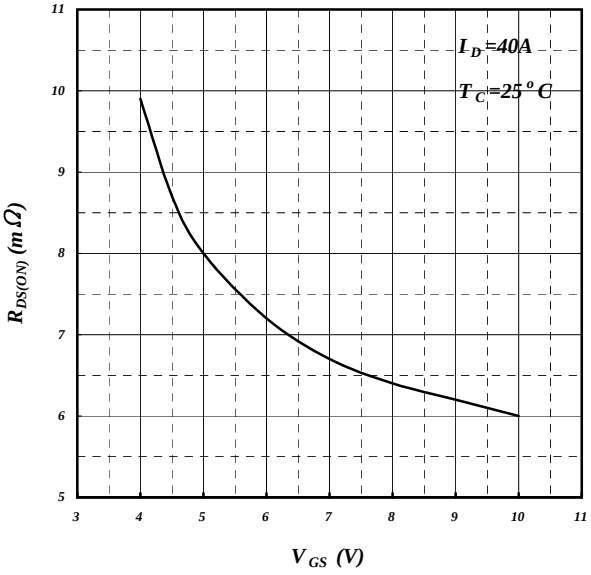


Fig 3. On-Resistance v.s. Gate Voltage

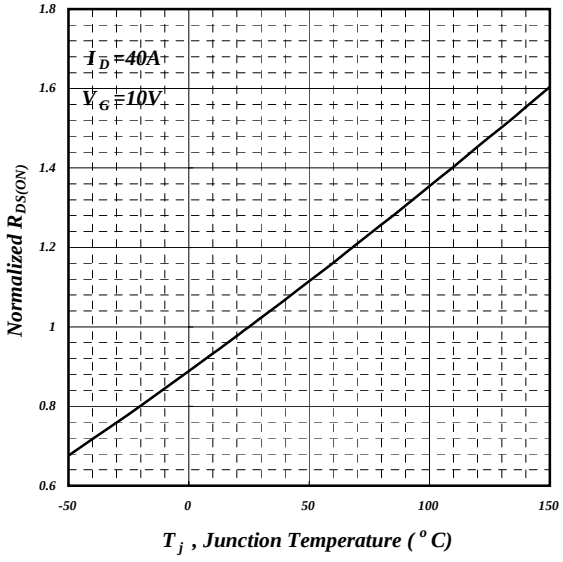


Fig 4. Normalized On-Resistance v.s. Junction Temperature

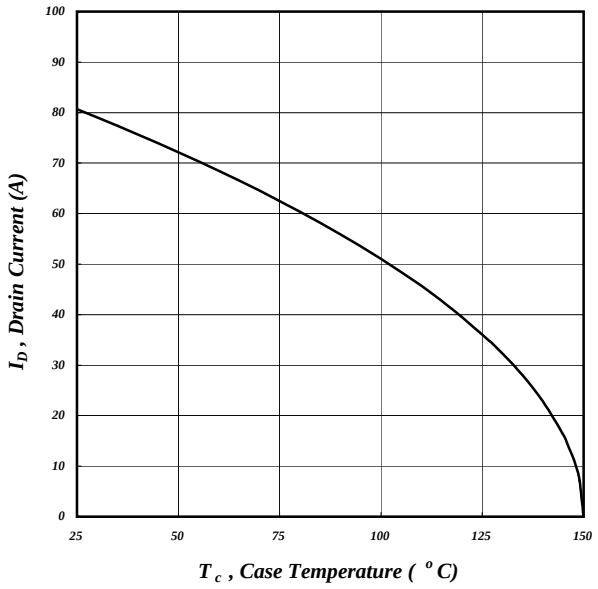


Fig 5. Maximum Drain Current v.s. Case Temperature

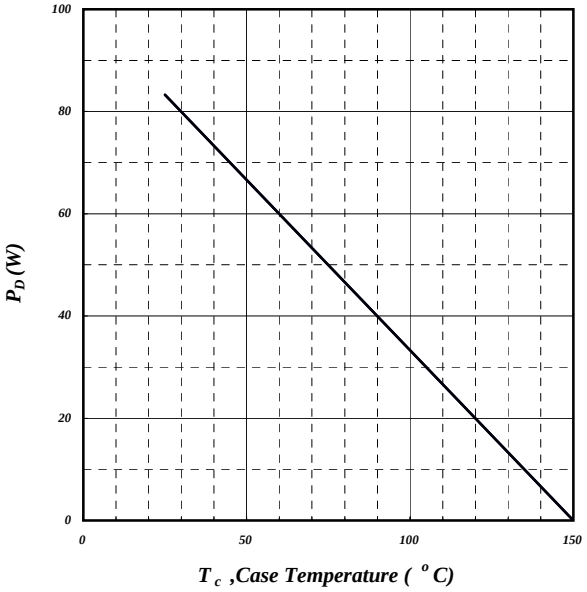


Fig 6. Typical Power Dissipation

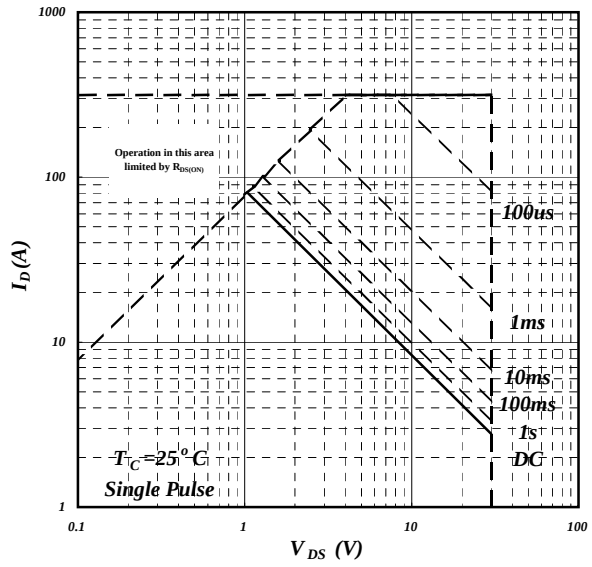


Fig 7. Maximum Safe Operating Area

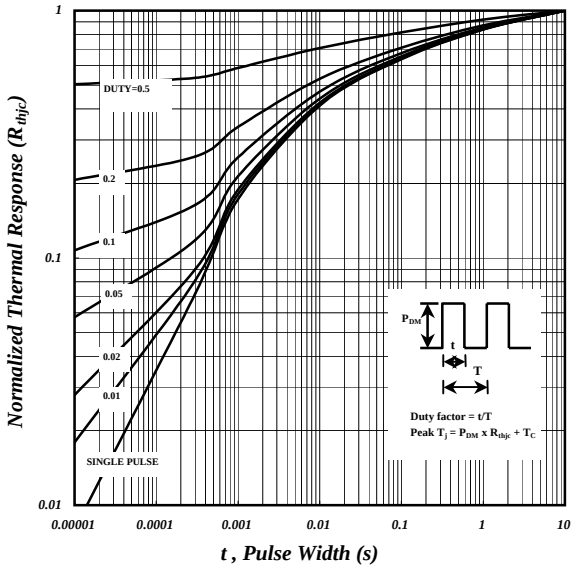


Fig 8. Effective Transient Thermal Impedance

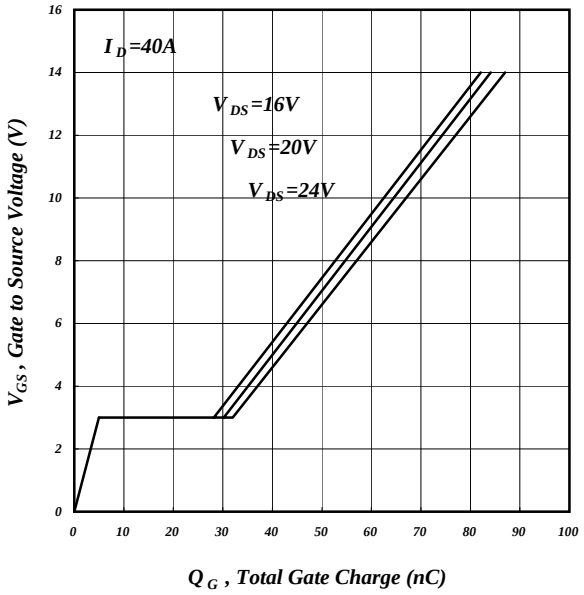


Fig 9. Gate Charge Characteristics

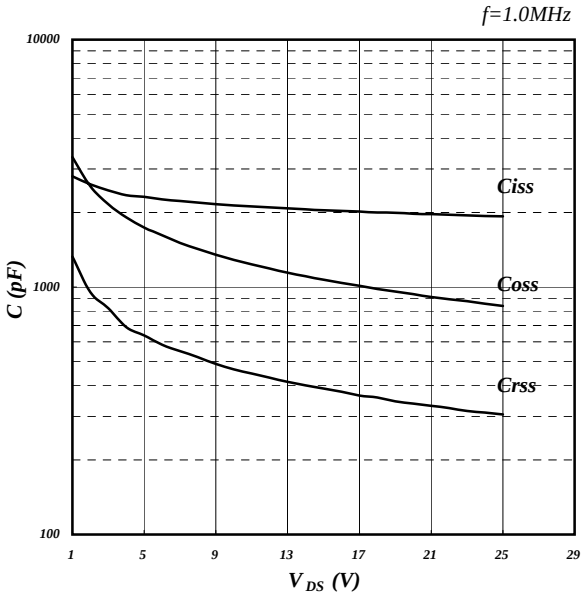


Fig 10. Typical Capacitance Characteristics

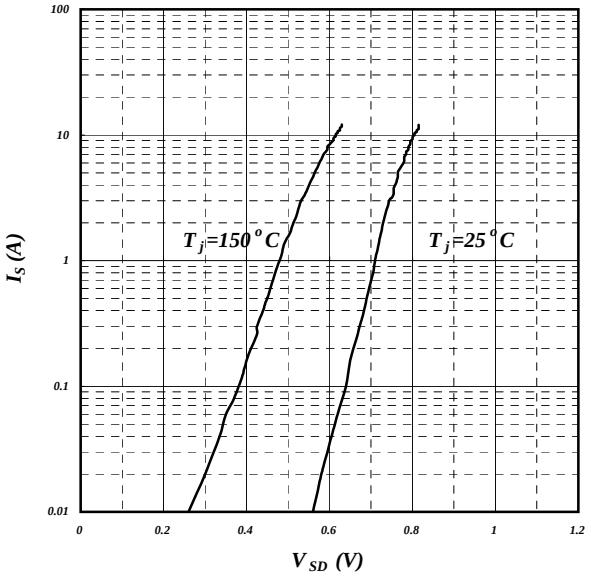


Fig 11. Forward Characteristic of Reverse Diode

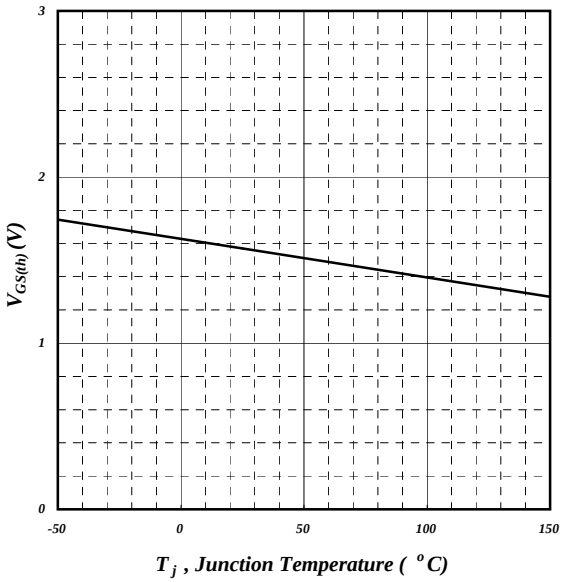


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

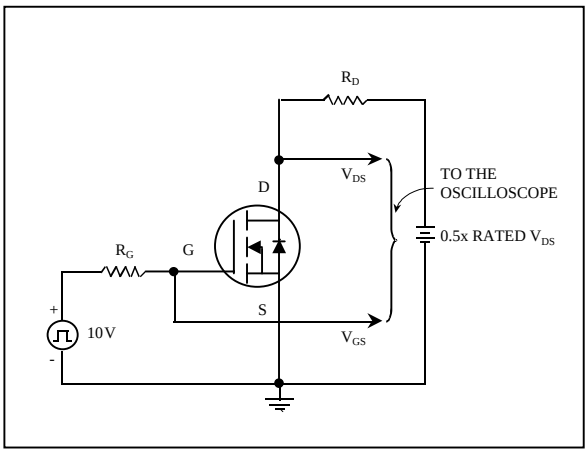


Fig 13. Switching Time Circuit

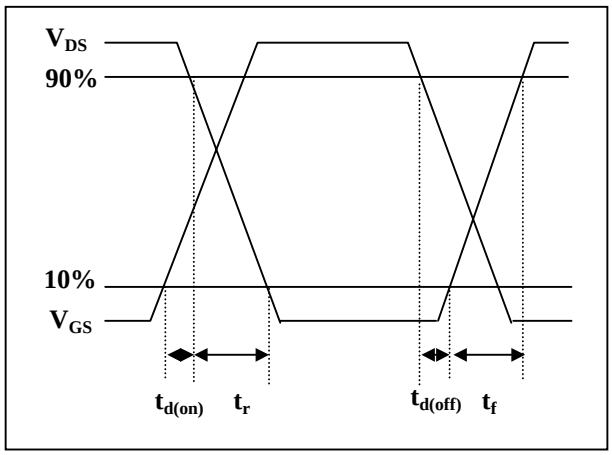


Fig 14. Switching Time Waveform

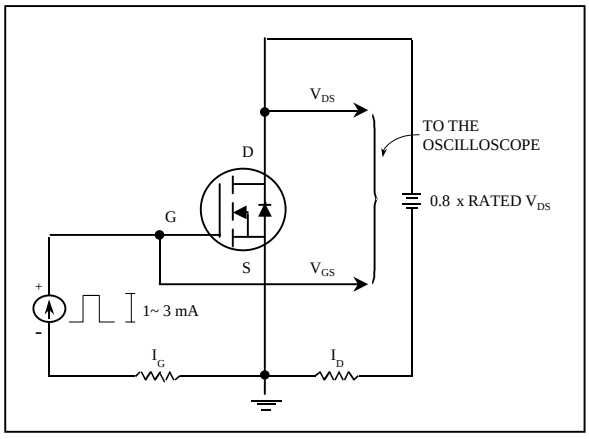


Fig 15. Gate Charge Circuit

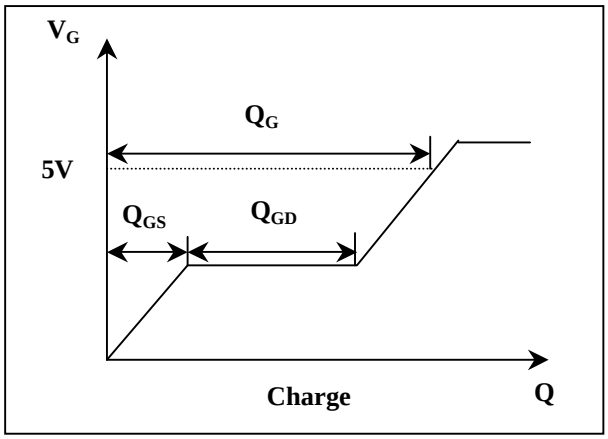
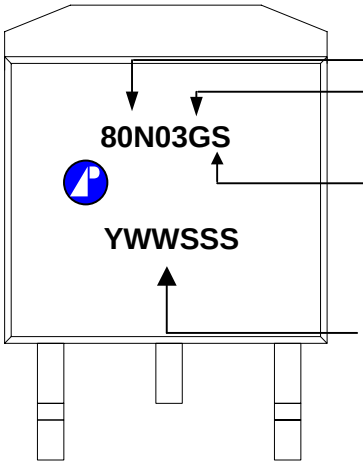


Fig 16. Gate Charge Waveform

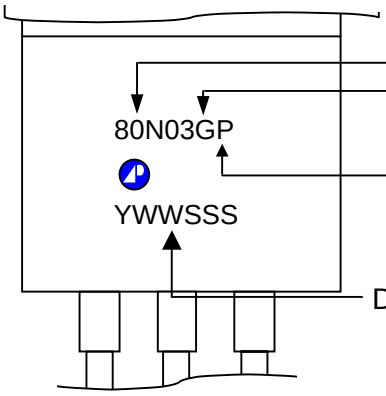
MARKING INFORMATION

TO-263



Part Number
meet Rohs requirement
for low voltage MOSFET only
Package Code
Date Code (YWWSSS)
Y：Last Digit Of The Year
WW：Week
SSS：Sequence

TO-220



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