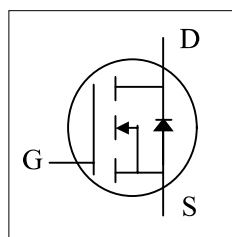


AP040N03G

N-Channel Power MOSFET

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

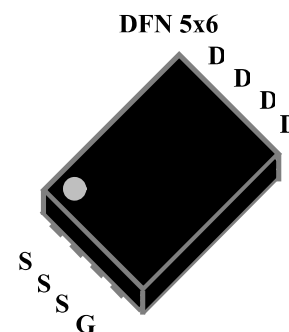


BV_{DSS}	30V
$R_{DS(ON)}$	3.6m Ω
I_D	80A

Description

AP040N03G 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 PDFN5*6 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 (AP040N03G) are available for low-profile applications.



Schematic diagram

Absolute Maximum Ratings@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	80	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	49	A
I_{DM}	Pulsed Drain Current ¹	320	A
E_{AS}	Single Pulsed Avalanche Energy	200	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	30	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-c}	Maximum Thermal Resistance, Junction-case	2.5	$^\circ\text{C}/\text{W}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^\circ\text{C}/\text{W}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient	110	$^\circ\text{C}/\text{W}$

AP040N03G
N-Channel Power MOSFET
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 ²	V _{GS} =10V, I _D =30A	-	3.6	4.2	mΩ
		V _{GS} =4.5V, I _D =20A	-	-	7.0	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 =15A	-	28	-	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 =20A	-	42	84	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	3.9	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	14	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V	-	13	-	ns
t _r	Rise Time	I _D =15A	-	36	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	43	-	ns
t _f	Fall Time	V _{GS} =10V	-	16	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1950	2350	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	320	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	240	-	pF
R _g	Gate Resistance	f=1.0MHz	-	0.9	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =30A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =10A, V _{GS} =0V,	-	16	-	ns
Q _{rr}	Body Diode Reverse Recovery	dI/dt=100A	-	5	-	nC

Notes:

- 1.Pulse width limited by max. junction temperature
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

Typical Performance Characteristics

Figure 1: Output Characteristics

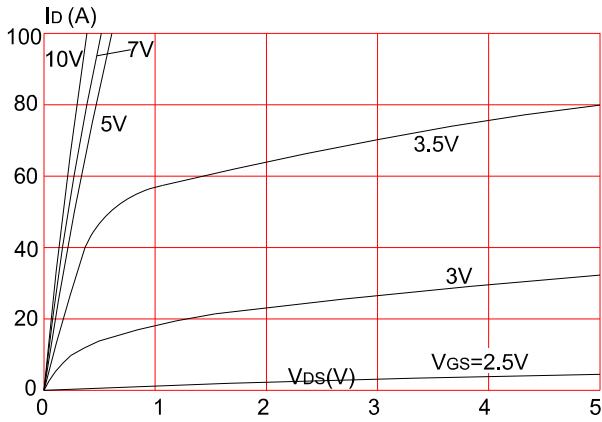


Figure 2: Typical Transfer Characteristics

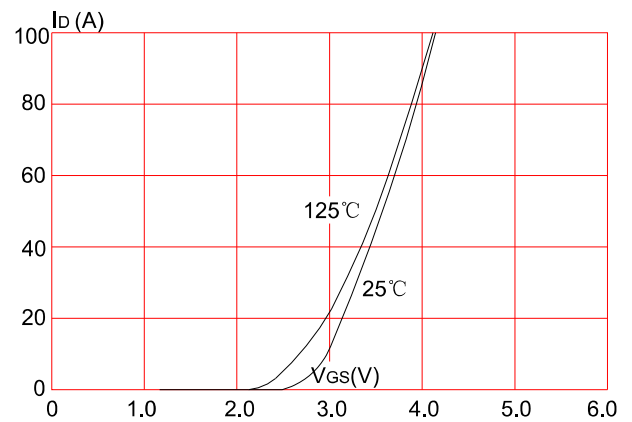


Figure 3: On-resistance vs. Drain Current

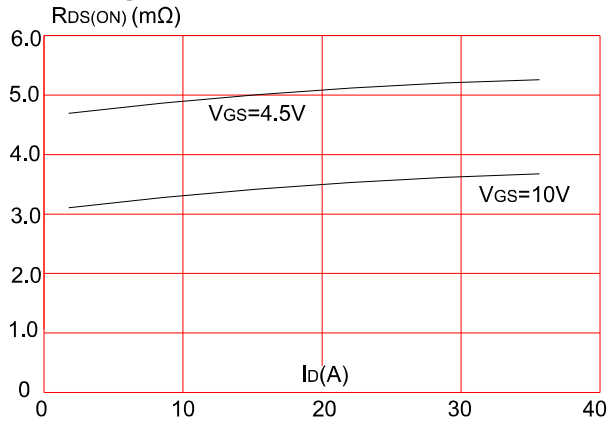


Figure 4: Body Diode Characteristics

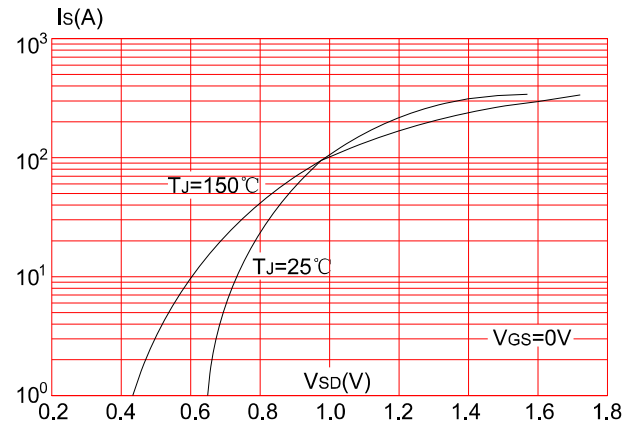


Figure 5: Gate Charge Characteristics

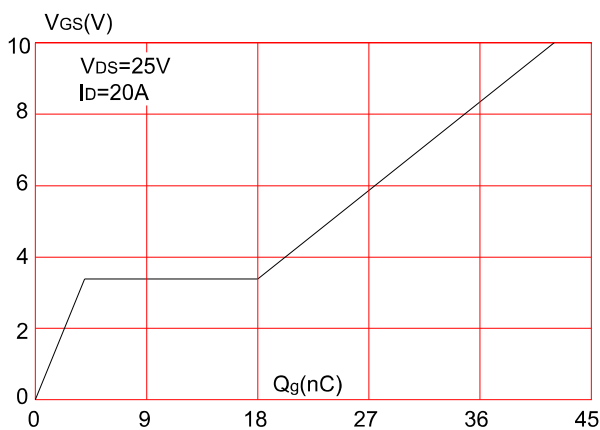
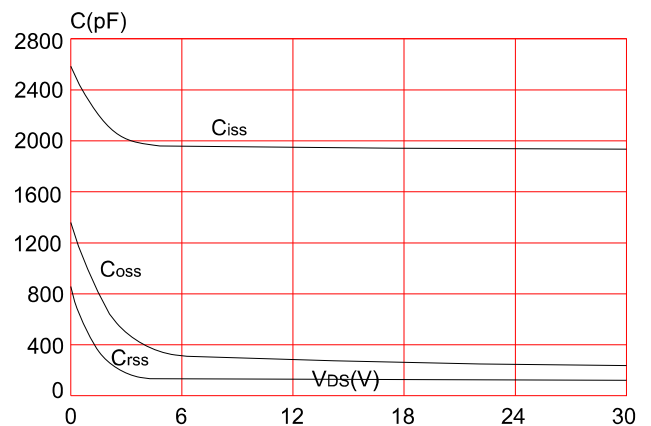


Figure 6: Capacitance Characteristics



AP040N03G

N-Channel Power MOSFET

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

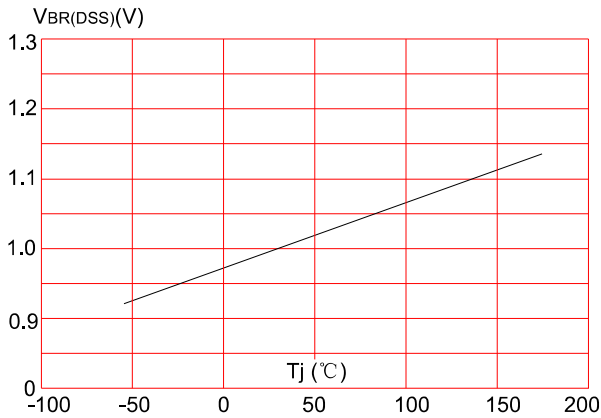


Figure 8: Normalized on Resistance vs. Junction Temperature

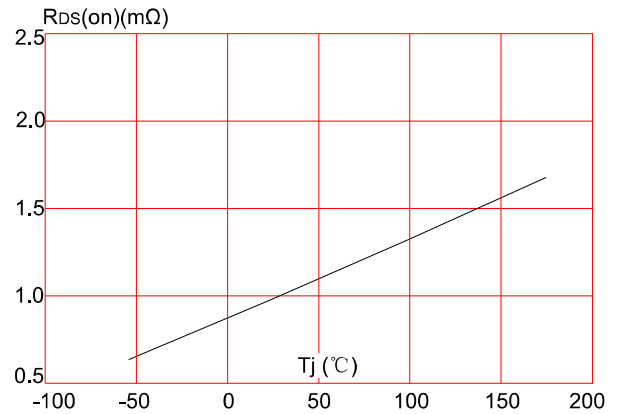


Figure 9: Maximum Safe Operating Area

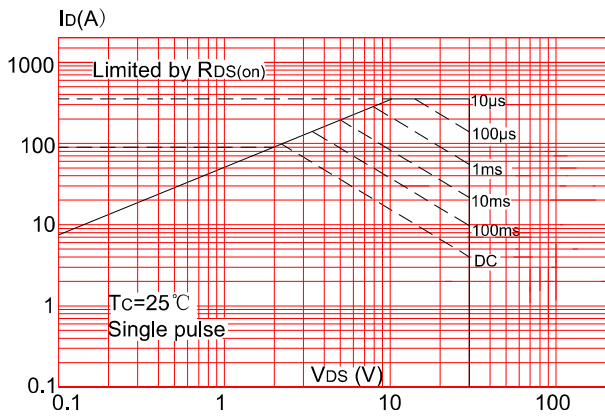


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

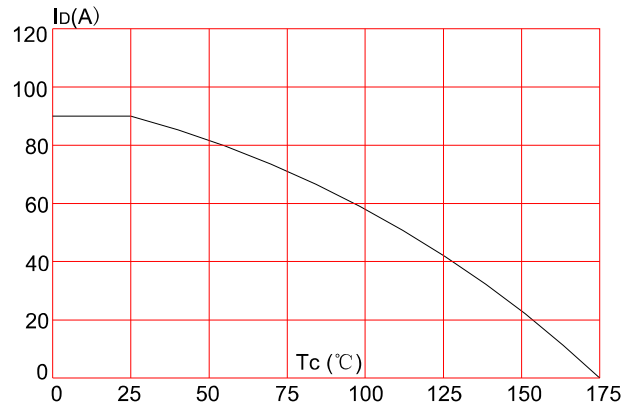
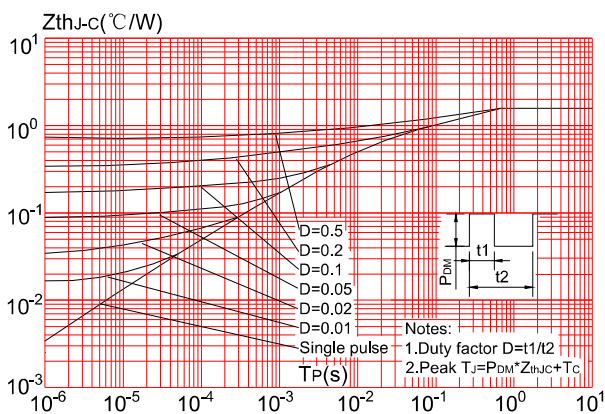
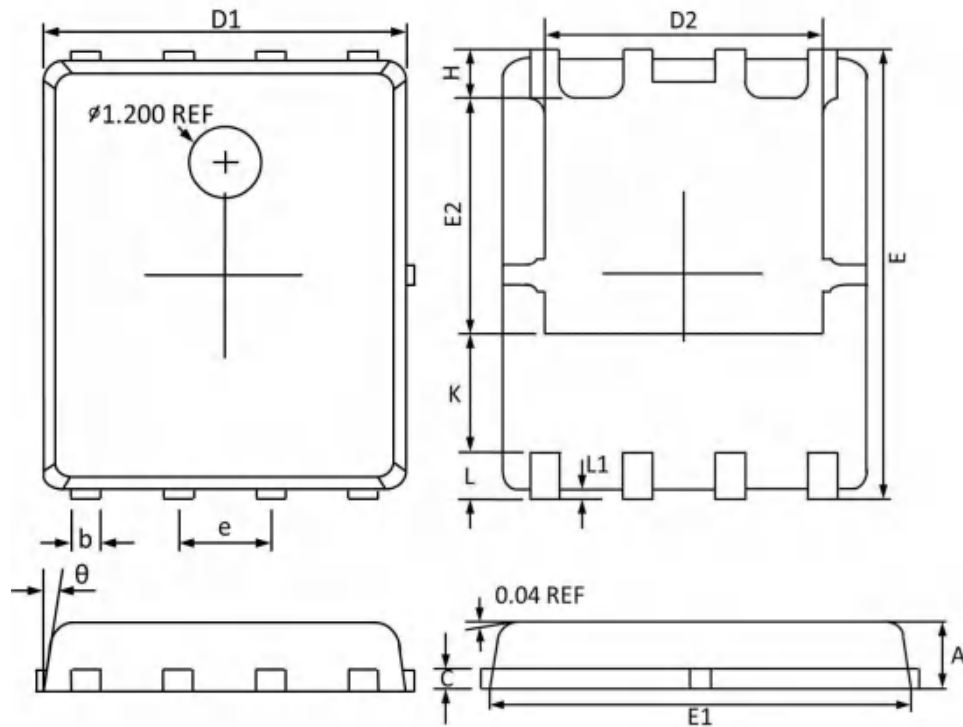


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)



PPAK5x6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°