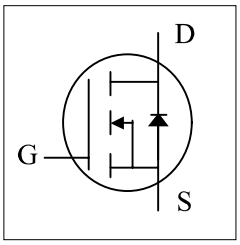
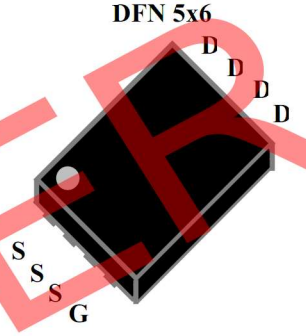
- ▼ **Low On-resistance**
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Characteristic**
- ▼ **RoHS Compliant & Halogen-Free**



BV_{DSS}	30V
$R_{DS(ON)}$	3.6mΩ
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°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	49	A
I_{DM}	Pulsed Drain Current[1]	320	A
E_{AS}	Single Pulsed Avalanche Energy	200	mJ
P_D@T_C=25℃	Total Power Dissipation	30	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	2.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	62.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	℃/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[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 in^2 copper pad of FR4 board

Typical Performance Characteristics

Figure1: Output Characteristics

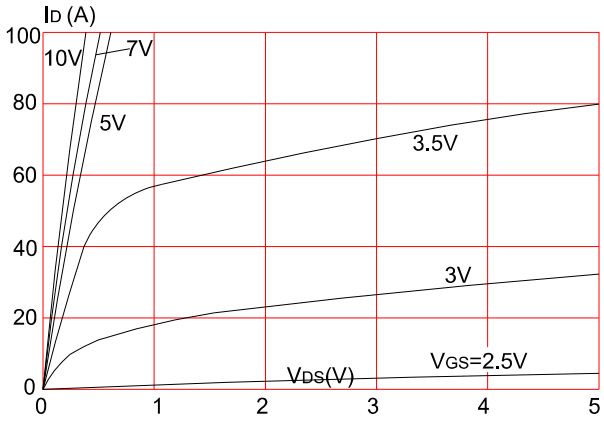


Figure 2: Typical Transfer Characteristics

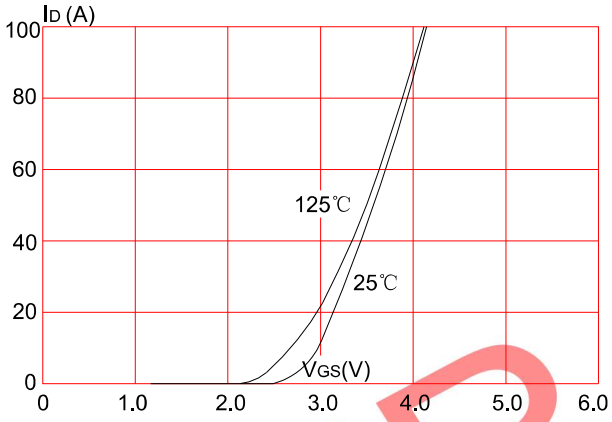


Figure 3: On-resistance vs. Drain Current

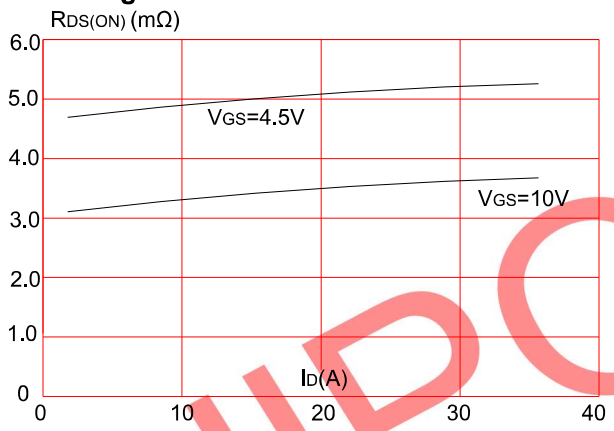


Figure 4: Body Diode Characteristics

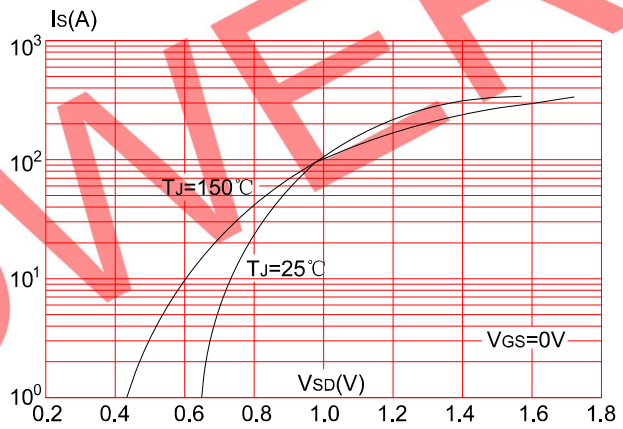


Figure 5: Gate Charge Characteristics

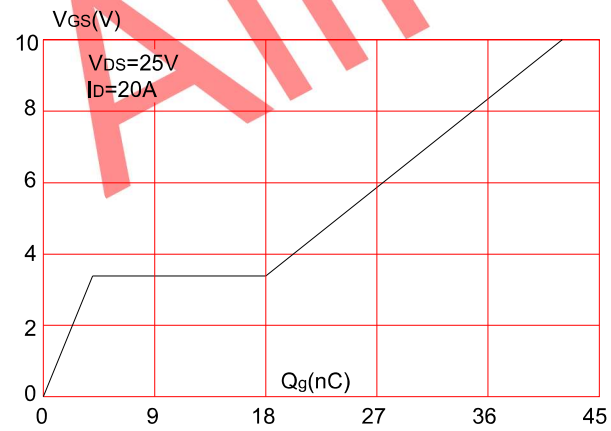


Figure 6: Capacitance Characteristics

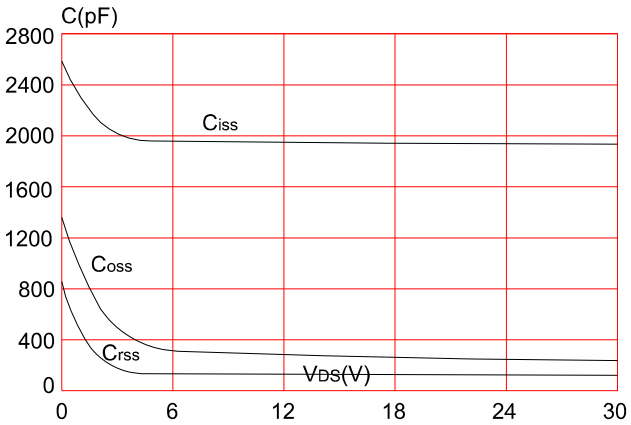


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

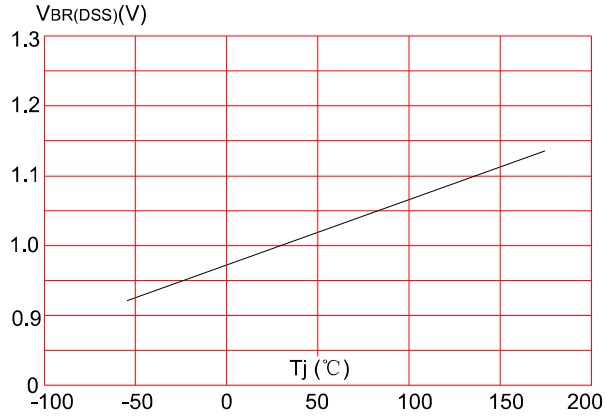


Figure 8: Normalized on Resistance vs. Junction Temperature

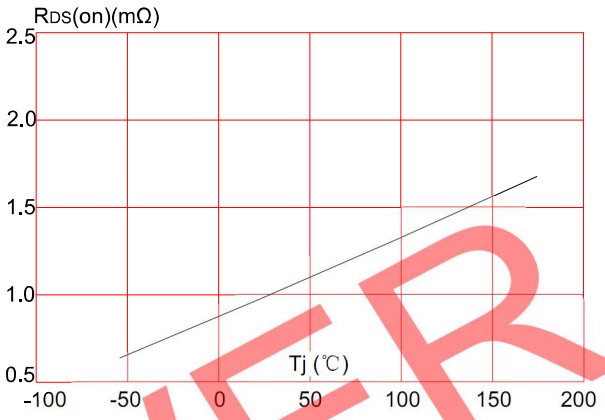


Figure 9: Maximum Safe Operating Area

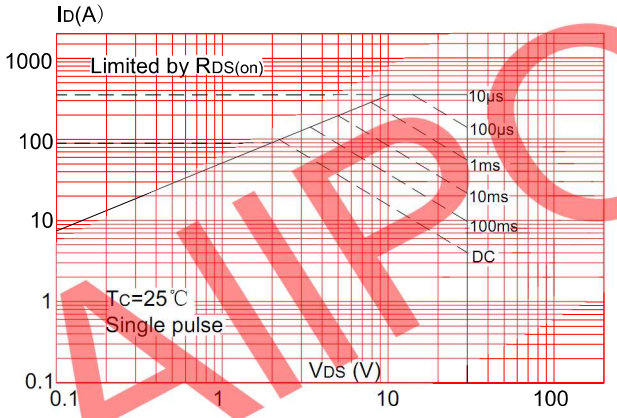


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

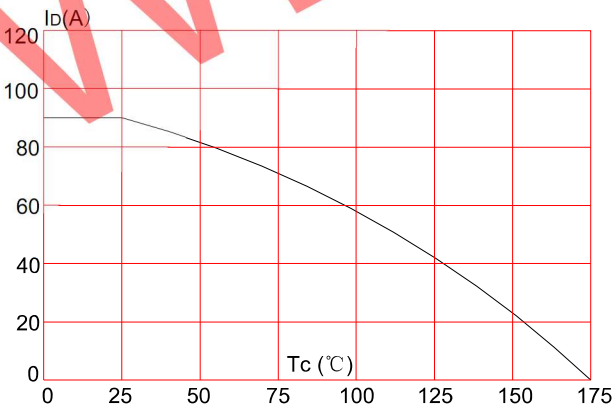
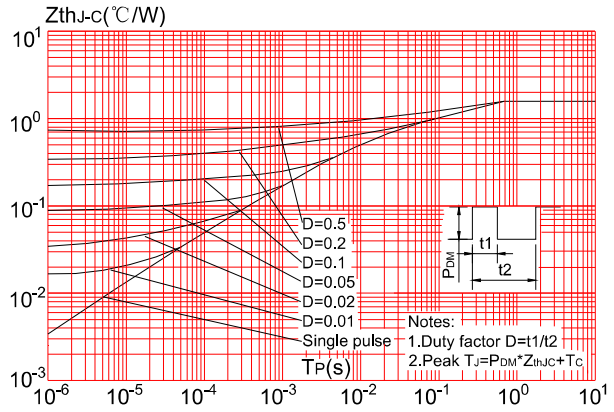
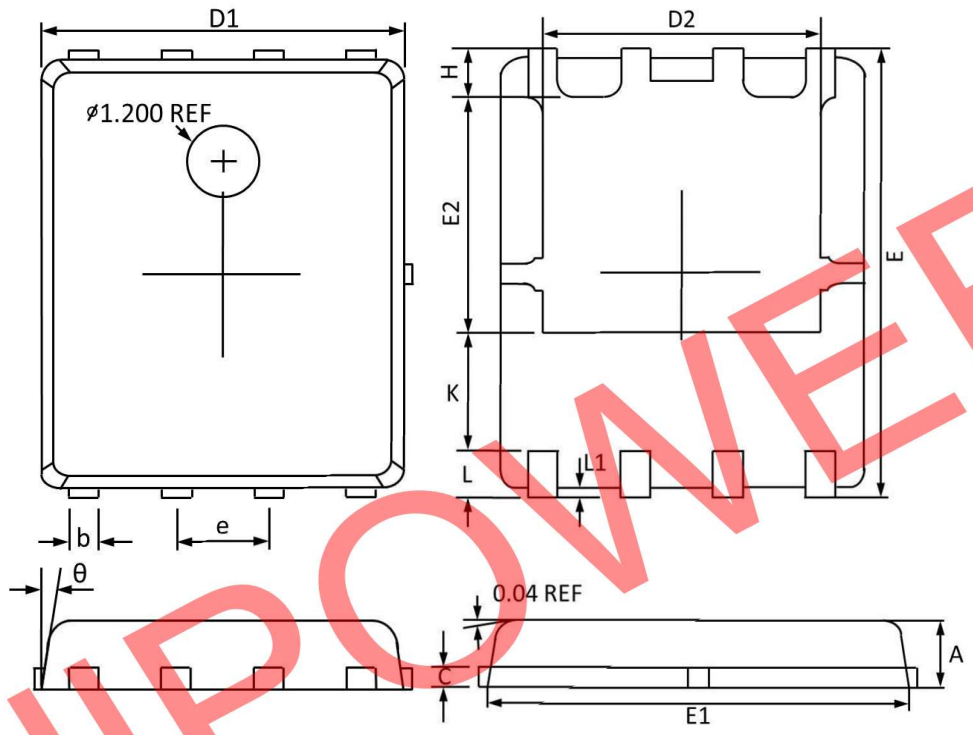


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)



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°

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