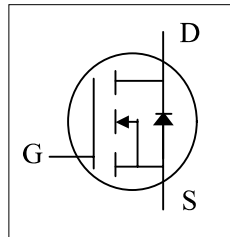


AP06N03Q

N-Channel Power MOSFET

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

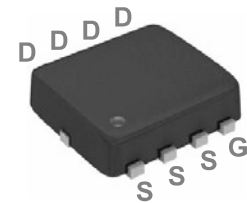


BV_{DSS}	30V
$R_{DS(ON)}$	6.0m Ω
I_D	52A

Description

AP06N03Q 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 DFN3X3 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 (AP06N03Q) 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
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	52	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	33	A
I_{DM}	Pulsed Drain Current ¹	125	A
E_{AS}	Single Pulsed Avalanche Energy	240	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	27	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-c}	Maximum Thermal Resistance, Junction-case	4.6	°C/W
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	50	°C/W

AP06N03Q
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 =20A	-	5.0	6.0	mΩ
		V _{GS} =4.5V, I _D =15A	-	-	8.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	1.7	3	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	67	-	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 =15A	-	8	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V	-	2.4	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	3.2	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V	-	7.1	-	ns
t _r	Rise Time	I _D =15A	-	40	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	15	-	ns
t _f	Fall Time	V _{GS} =10V	-	6	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	814	-	pF
C _{oss}	Output Capacitance	V _{DS} =15V	-	498	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	41	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.7	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =10A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V,	-	15	-	ns
Q _{rr}	Body Diode Reverse Recovery	dI/dt=100A	-	25	-	nC

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. V_{DD} = 25V, R_G = 25Ω, L = 0.1mH ,Starting T_J = 25°C
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics

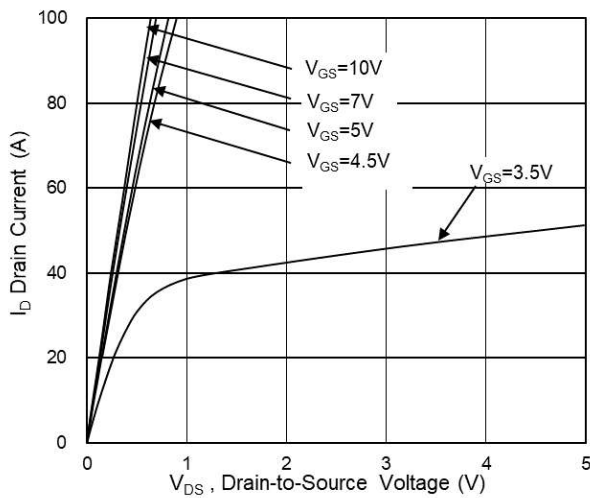


Fig.1 Typical Output Characteristics

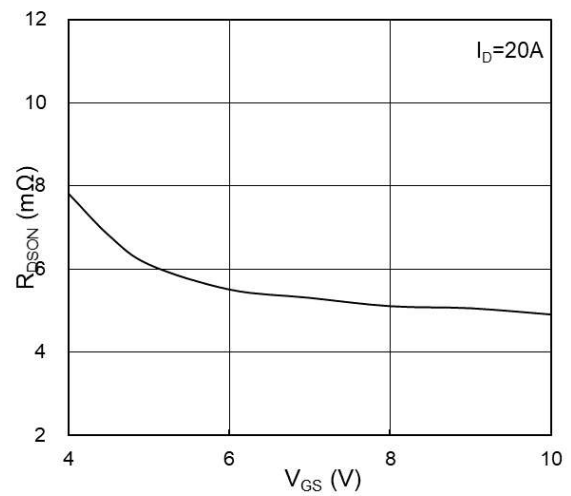


Fig.2 On-Resistance vs G-S Voltage

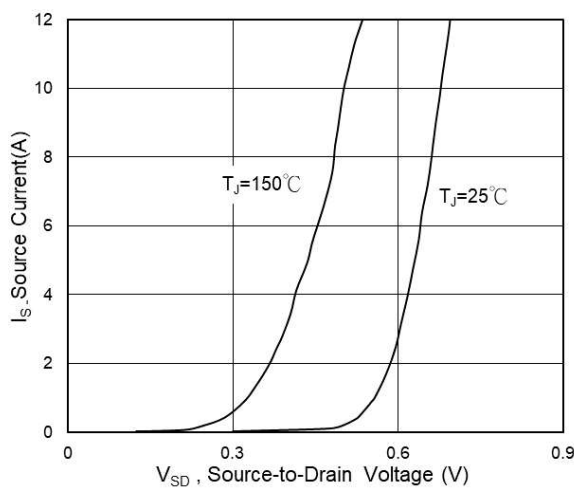


Fig.3 Source Drain Forward Characteristics

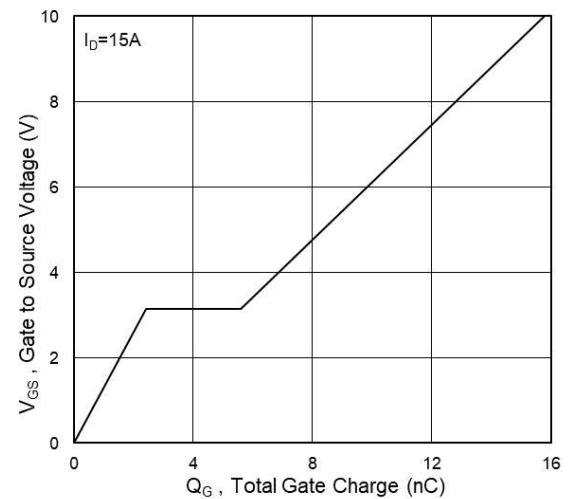


Fig.4 Gate-Charge Characteristics

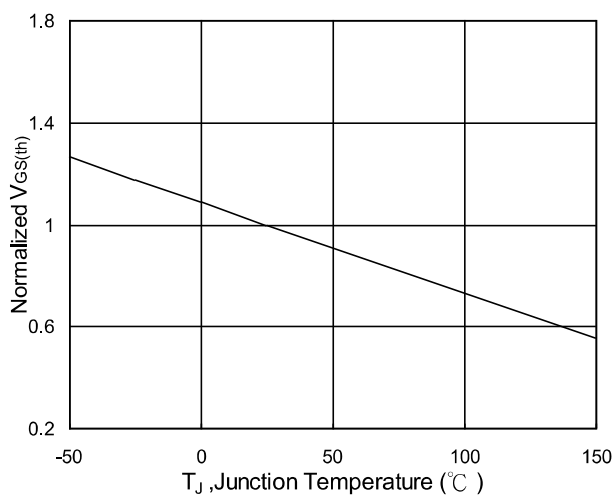


Fig.5 Normalized $V_{GS(th)}$ vs T_J

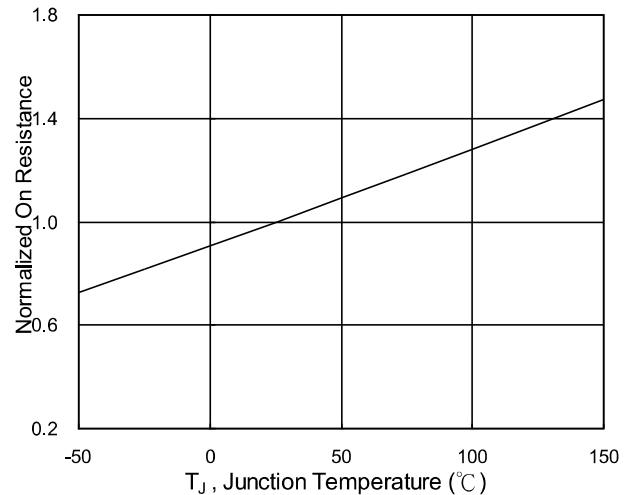


Fig.6 Normalized $R_{DS(on)}$ vs T_J

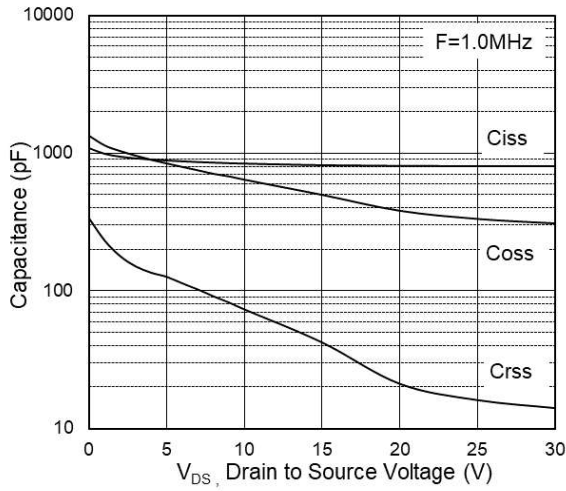


Fig.7 Capacitance

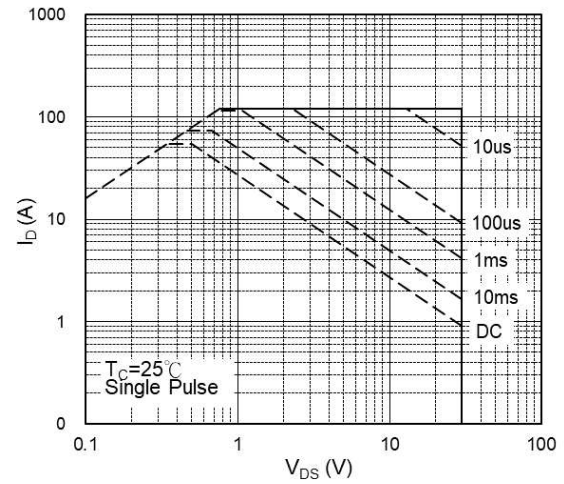


Fig.8 Safe Operating Area

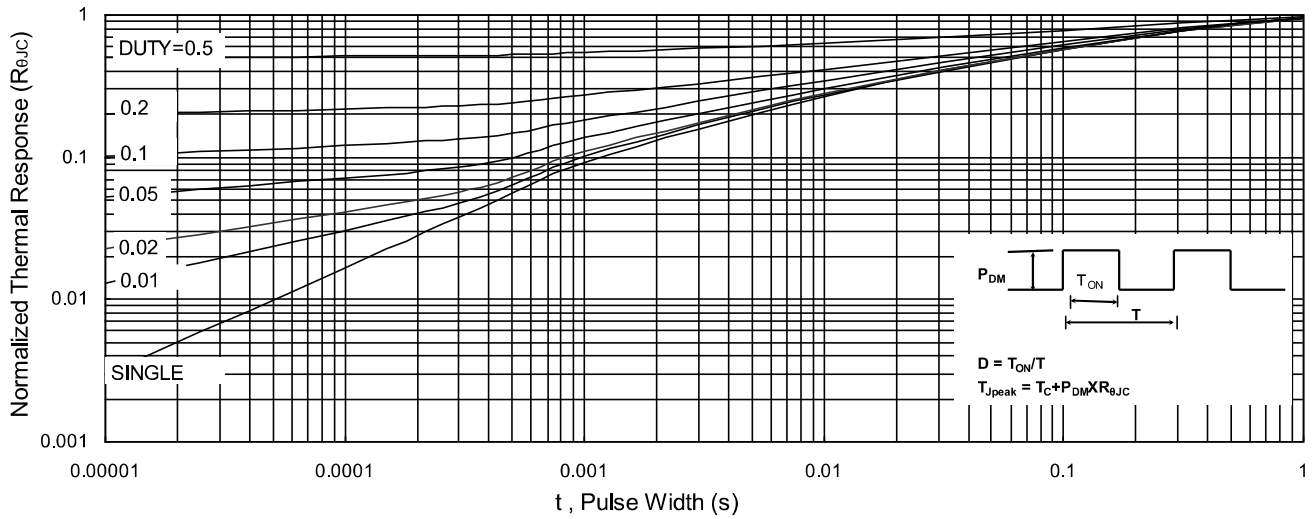


Fig.9 Normalized Maximum Transient Thermal Impedance

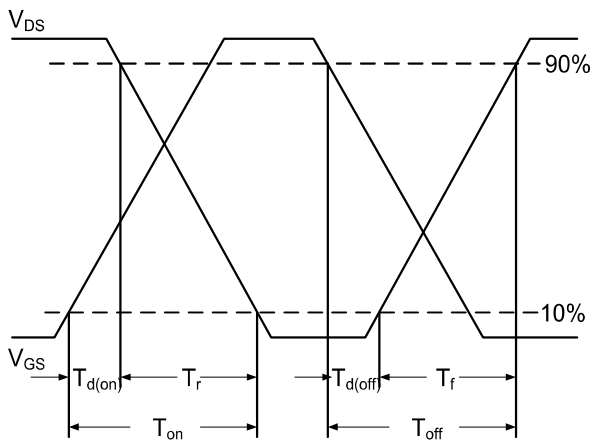


Fig.10 Switching Time Waveform

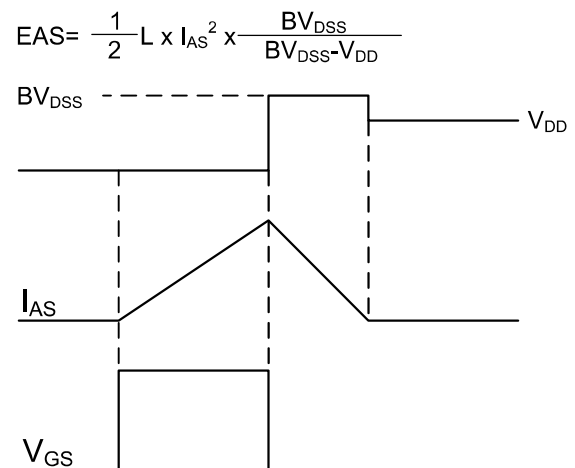
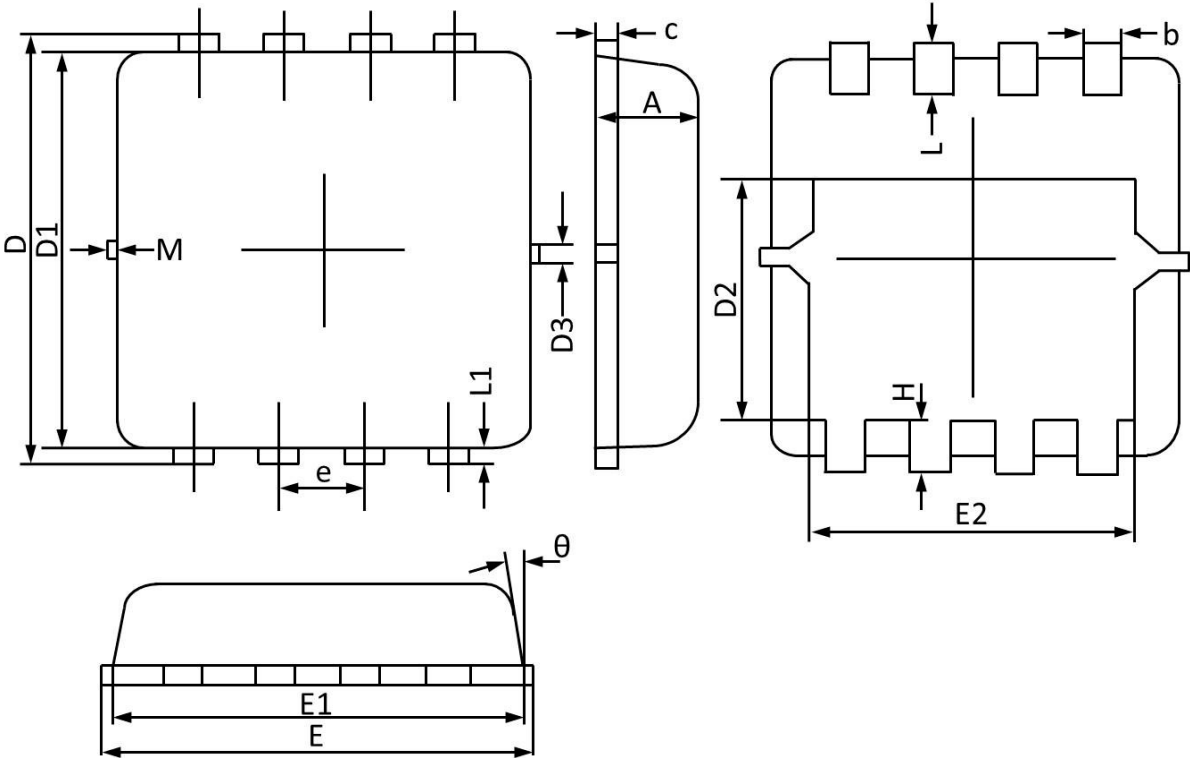


Fig.11 Unclamped Inductive Switching Waveform

PPAK3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

AP06N03Q**N-Channel Power MOSFET**

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