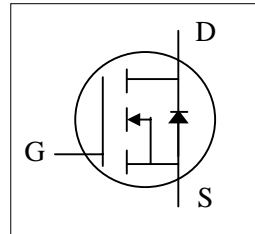




- ▼ Low On-resistance
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

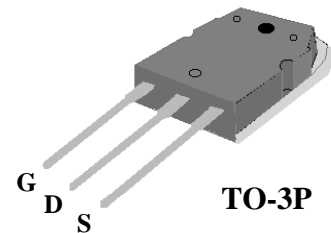


BV_{DSS}	500V
$R_{DS(ON)}$	0.27 Ω
I_D	20A

Description

AP18N50 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-3P package is widely preferred for commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	+30	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	20	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	10	A
I_{DM}	Pulsed Drain Current ¹	80	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	150	W
E_{AS}	Single Pulse Avalanche Energy ²	200	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.833	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	$^\circ\text{C}/\text{W}$



AP18N50W-HF

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 =1mA	500	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V, I _D =10A	-	-	0.27	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =10A	-	10	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =400V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =20A	-	94	150	nC
Q _{gs}	Gate-Source Charge	V _{DS} =400V	-	23	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	36	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =200V	-	113	-	ns
t _r	Rise Time	I _D =10A	-	80	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =50Ω	-	525	-	ns
t _f	Fall Time	V _{GS} =10V	-	100	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	4600	7400	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	350	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ³	I _S =20A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V	-	490	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	10	-	uC

Notes:

- 1.Pulse width limited by Max junction temperature.
- 2.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω
- 3.Pulse test

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.

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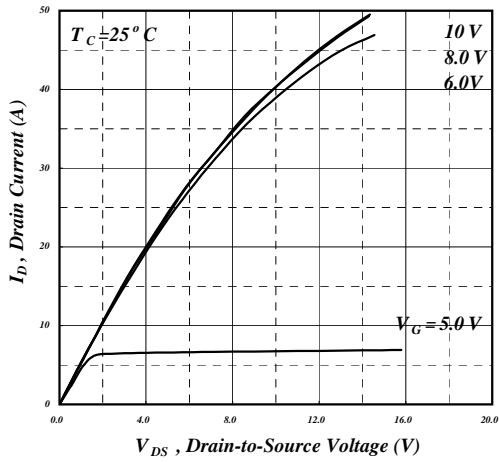


Fig 1. Typical Output Characteristics

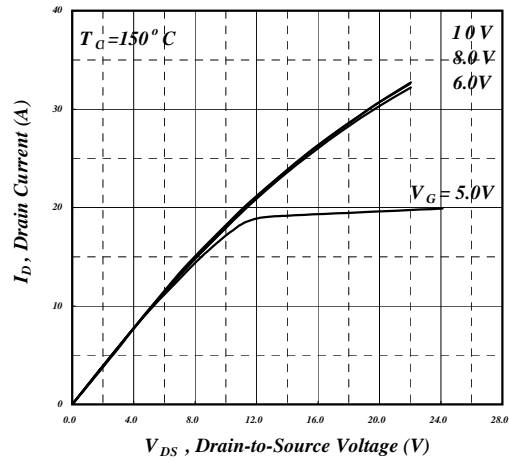


Fig 2. Typical Output Characteristics

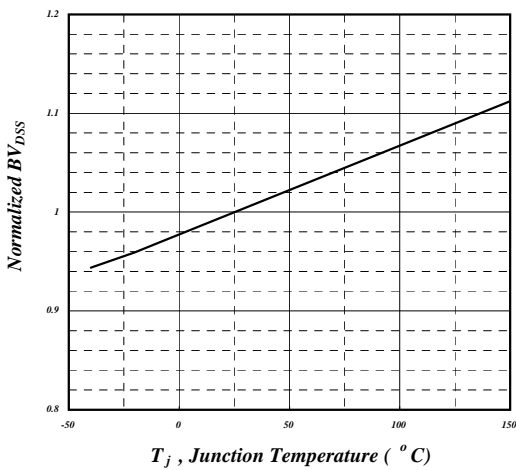


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

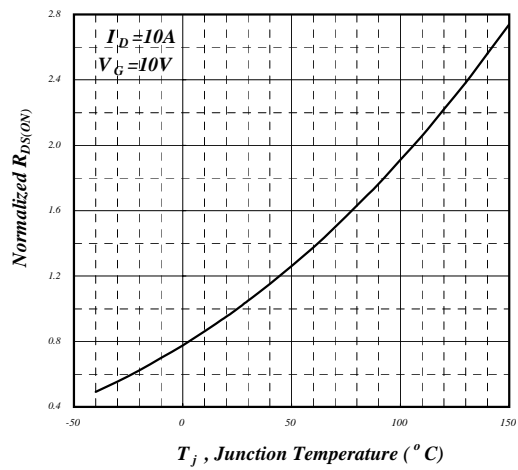


Fig 4. Normalized On-Resistance v.s. Junction Temperature

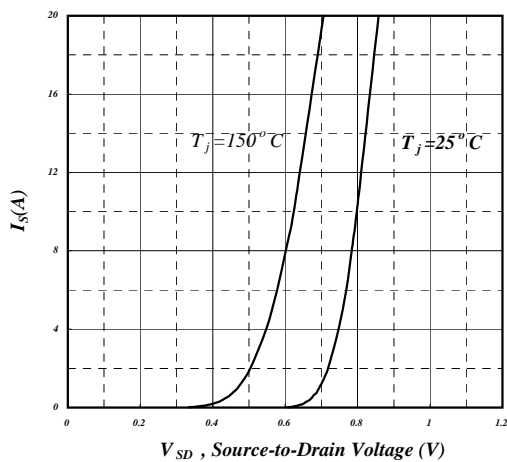


Fig 5. Forward Characteristic of Reverse Diode

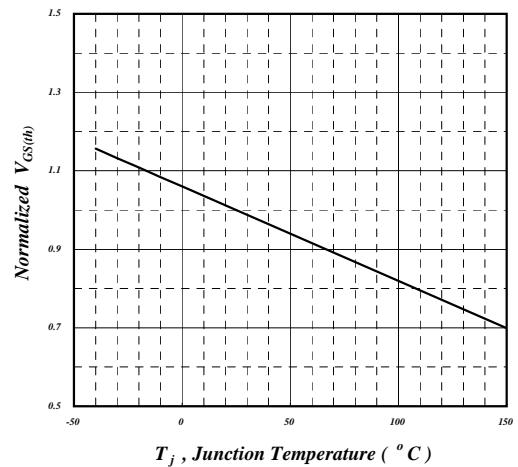


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

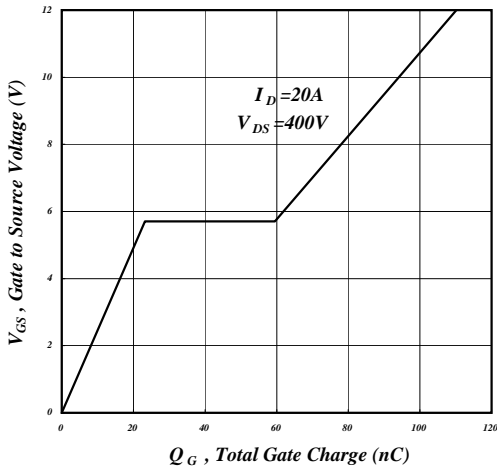


Fig 7. Gate Charge Characteristics

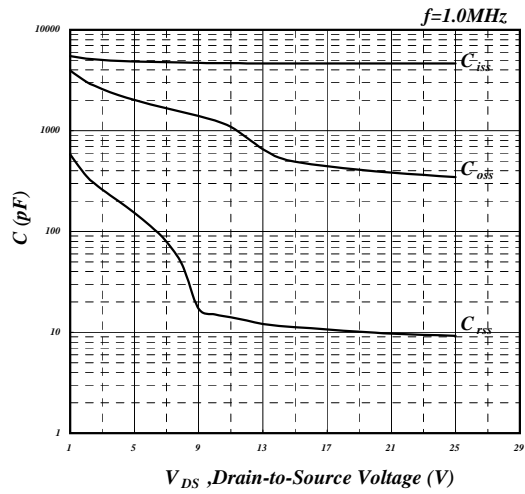


Fig 8. Typical Capacitance Characteristics

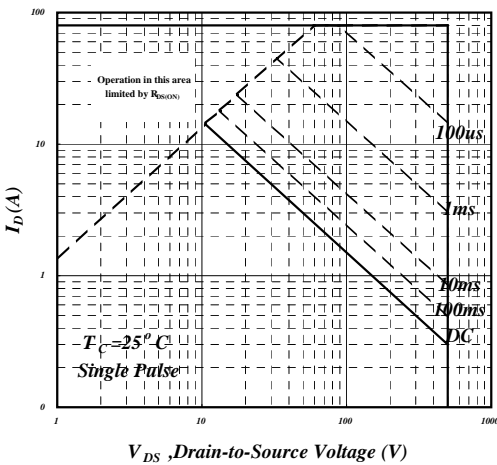


Fig 9. Maximum Safe Operating Area

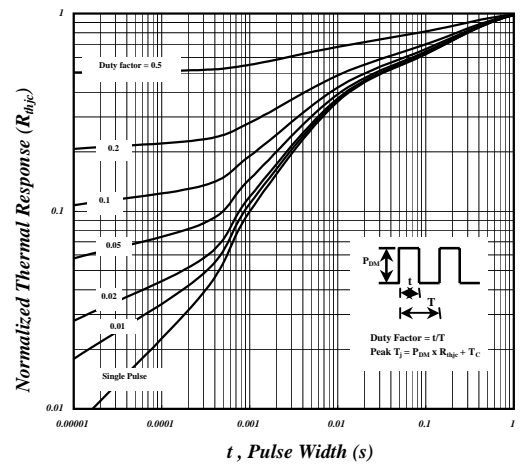


Fig 10. Effective Transient Thermal Impedance

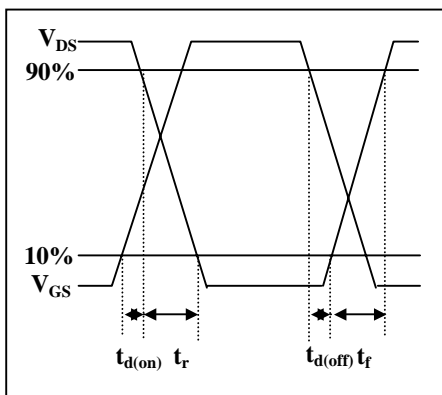


Fig 11. Switching Time Waveform

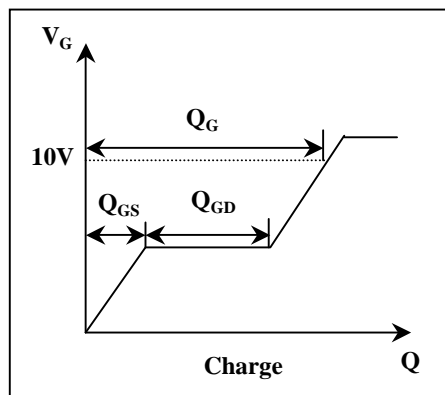
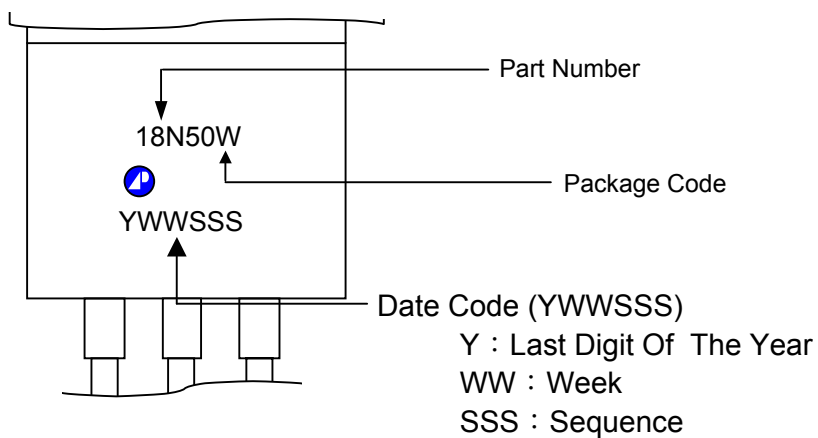


Fig 12. Gate Charge Waveform

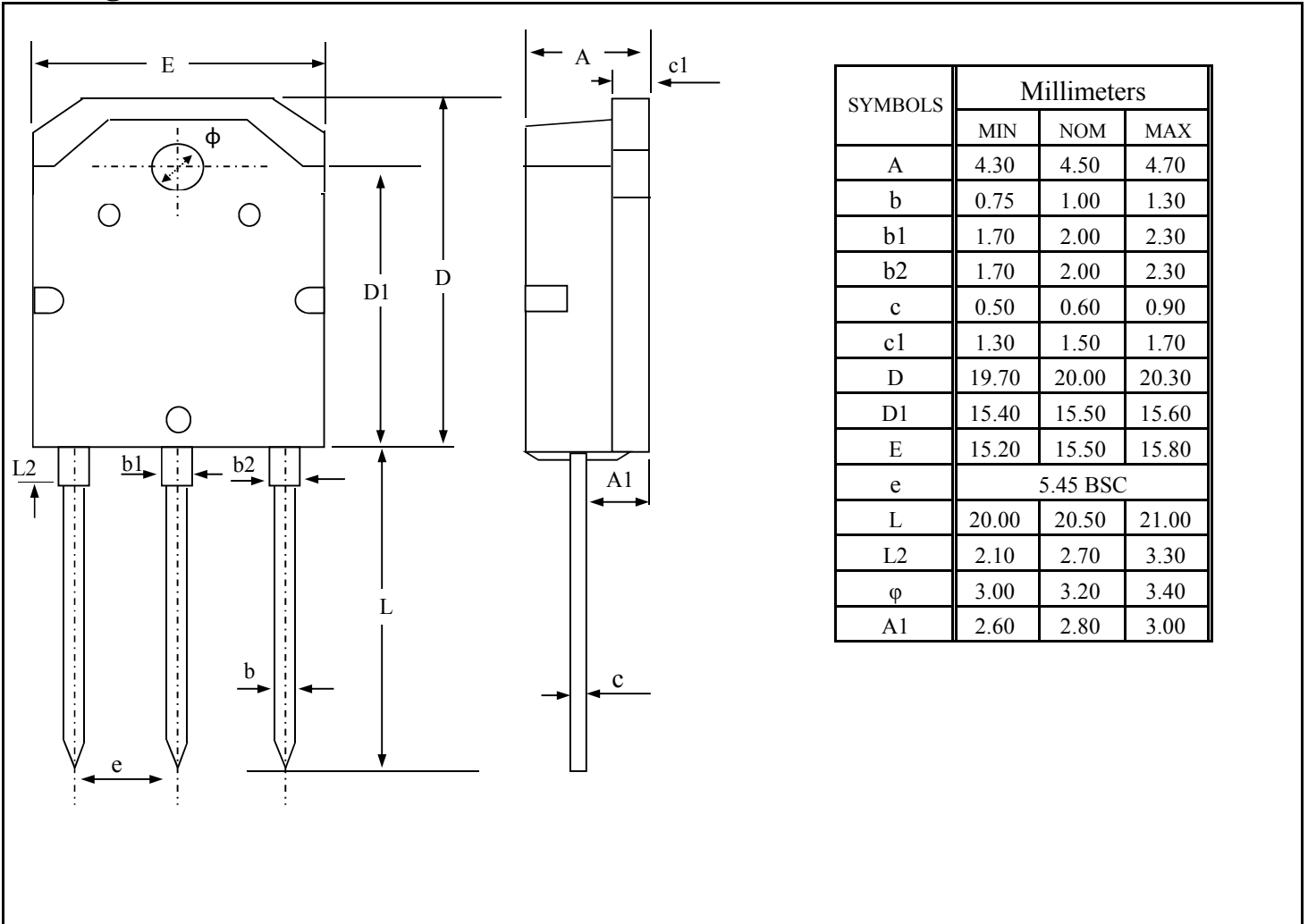


MARKING INFORMATION





Package Outline : TO-3P



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.30	4.50	4.70
b	0.75	1.00	1.30
b1	1.70	2.00	2.30
b2	1.70	2.00	2.30
c	0.50	0.60	0.90
c1	1.30	1.50	1.70
D	19.70	20.00	20.30
D1	15.40	15.50	15.60
E	15.20	15.50	15.80
e	5.45 BSC		
L	20.00	20.50	21.00
L2	2.10	2.70	3.30
φ	3.00	3.20	3.40
A1	2.60	2.80	3.00



TO-3P FOOTPRINT :

