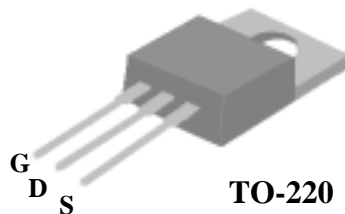




- ▼ Low Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching

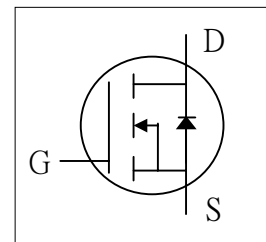


BV_{DSS}	30V
$R_{DS(ON)}$	17m Ω
I_D	40A

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220 package is universally preferred for all commercial-industrial applications and suited for low voltage applications such as DC/DC converters and high efficiency switching circuits.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	40	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	30	A
I_{DM}	Pulsed Drain Current ¹	169	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation	50	W
	Linear Derating Factor	0.4	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Thermal Resistance Junction-case	Max. 2.5	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-ambient	Max. 62	$^\circ C/W$



AP40N03GP

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
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.037	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A	-	14	17	mΩ
		V _{GS} =4.5V, I _D =16A	-	20	23	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 =20A	-	26	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ± 20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =20A	-	17	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =5V	-	10	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	7.2	-	ns
t _r	Rise Time	I _D =20A	-	60	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	22.5	-	ns
t _f	Fall Time	R _D =0.75Ω	-	10	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	800	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	380	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	133	-	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	-	-	40	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	169	A
V _{SD}	Forward On Voltage ²	T _j =25°C, I _S =40A, V _{GS} =0V	-	-	1.3	V

Notes:

1.Pulse width limited by safe operating area.

2.Pulse width ≤300us , duty cycle ≤2%.

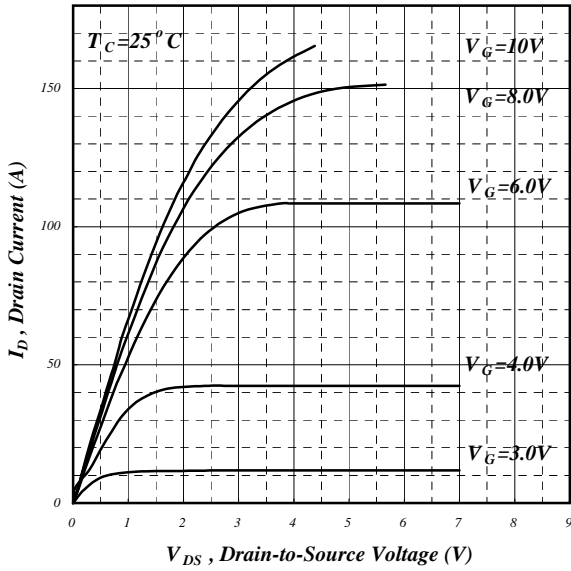


Fig 1. Typical Output Characteristics

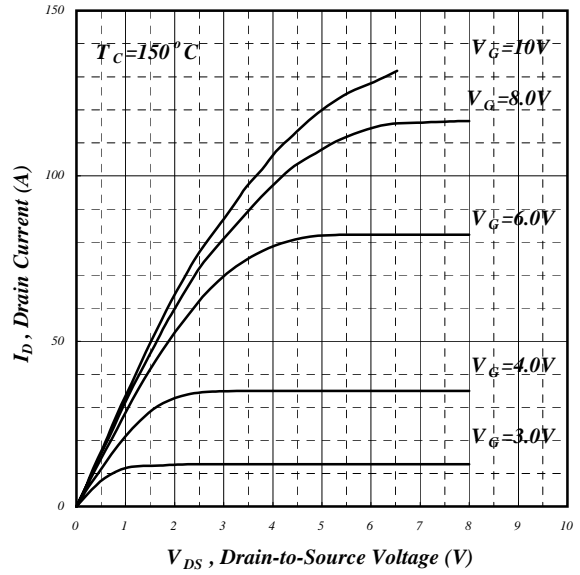


Fig 2. Typical Output Characteristics

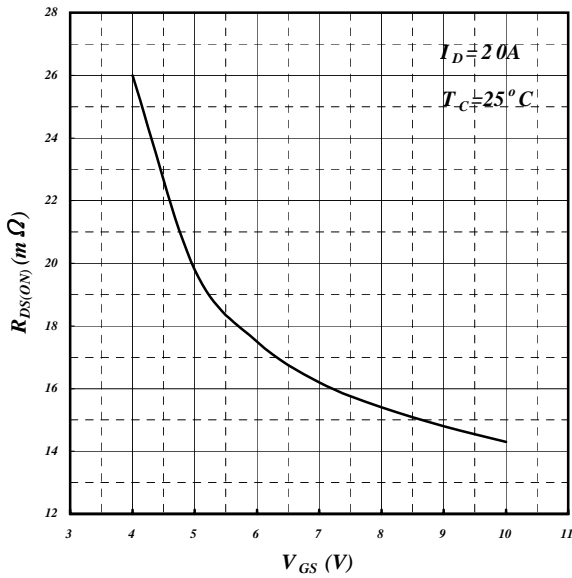


Fig 3. On-Resistance v.s. Gate Voltage

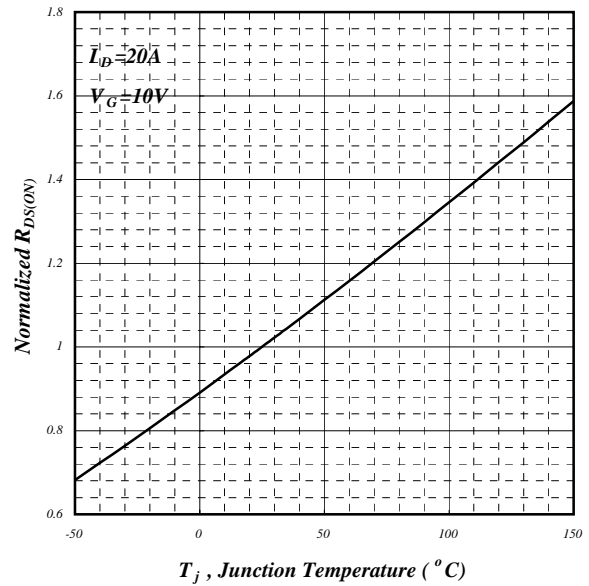


Fig 4. Normalized On-Resistance v.s. Junction Temperature

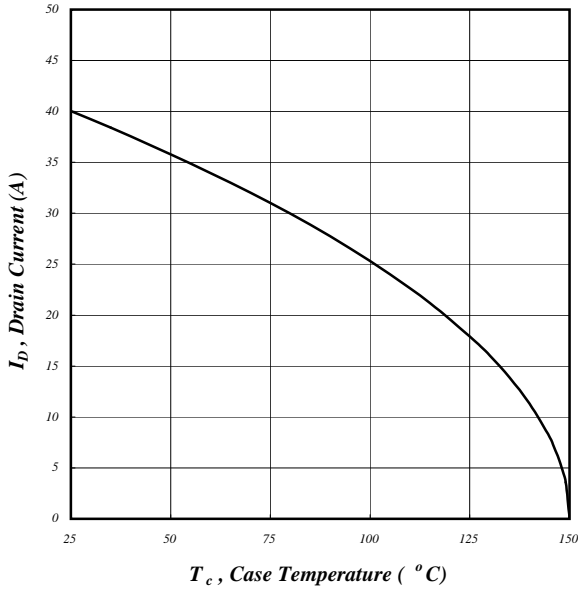


Fig 5. Maximum Drain Current v.s. Case Temperature

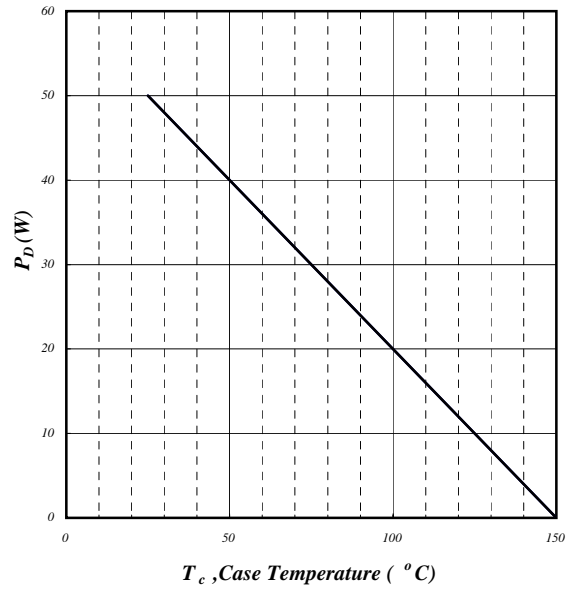


Fig 6. Typical Power Dissipation

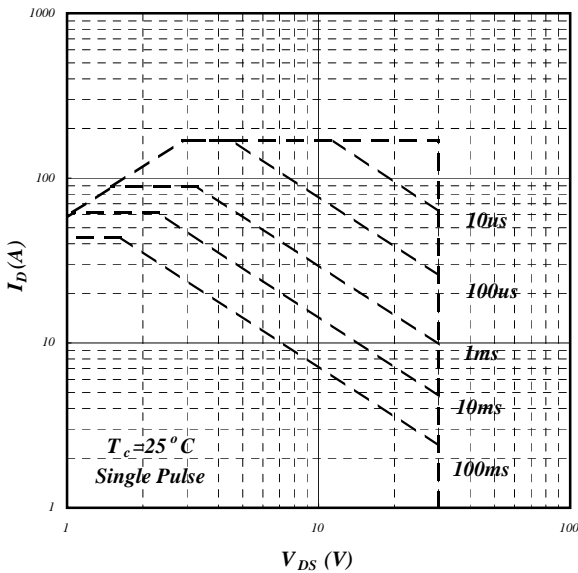


Fig 7. Maximum Safe Operating Area

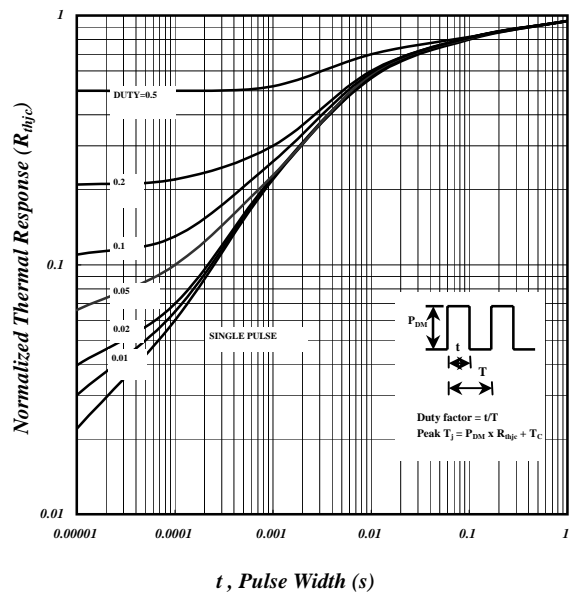


Fig 8. Effective Transient Thermal Impedance

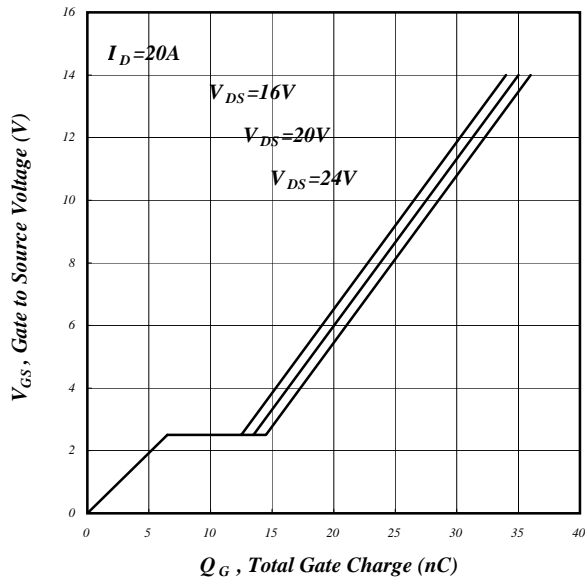


Fig 9. Gate Charge Characteristics

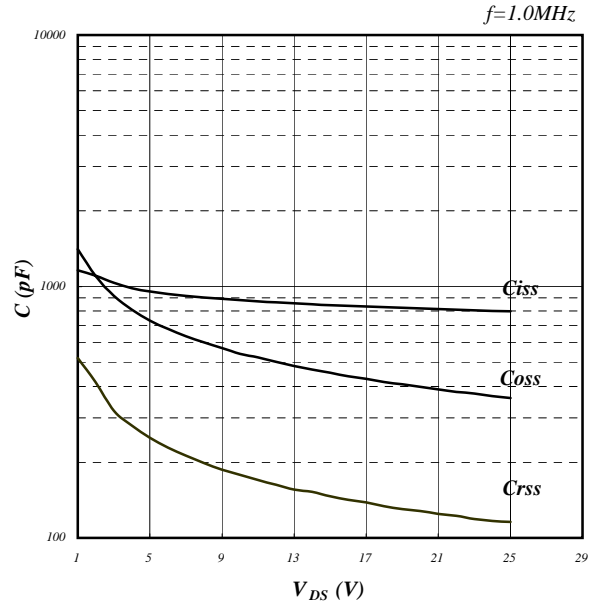


Fig 10. Typical Capacitance Characteristics

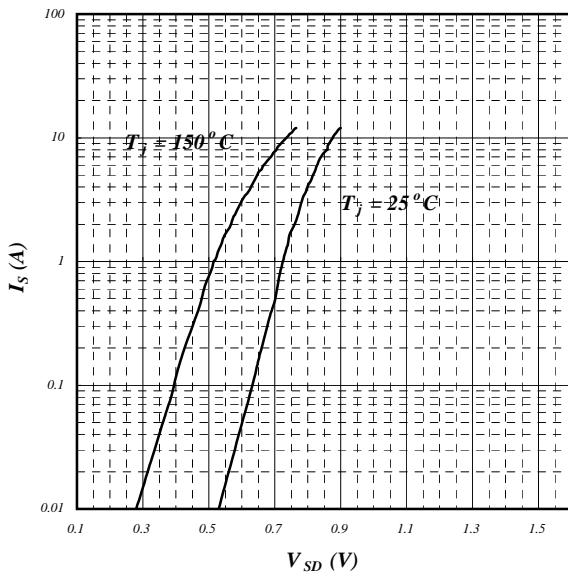


Fig 11. Forward Characteristic of Reverse Diode

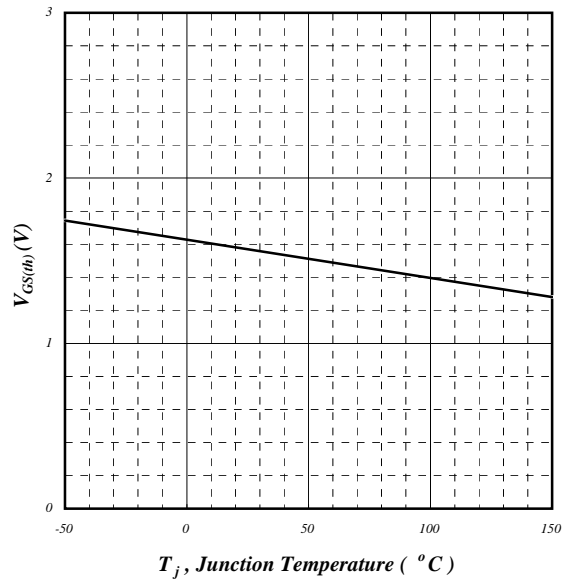


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

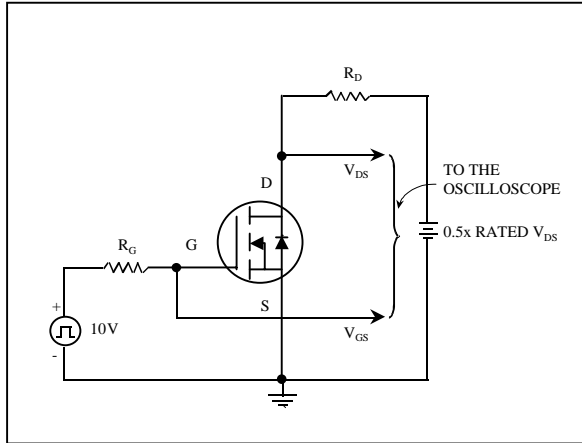


Fig 13. Switching Time Circuit

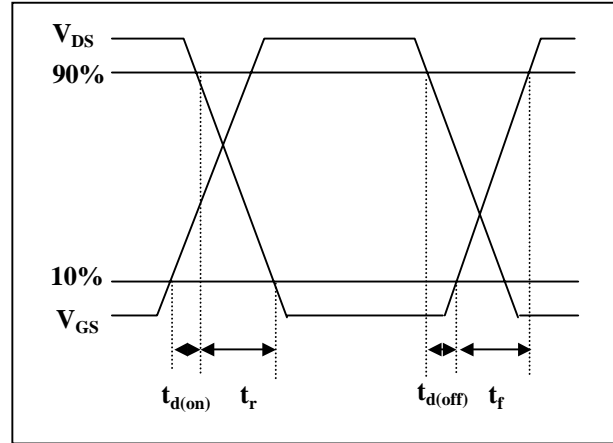


Fig 14. Switching Time Waveform

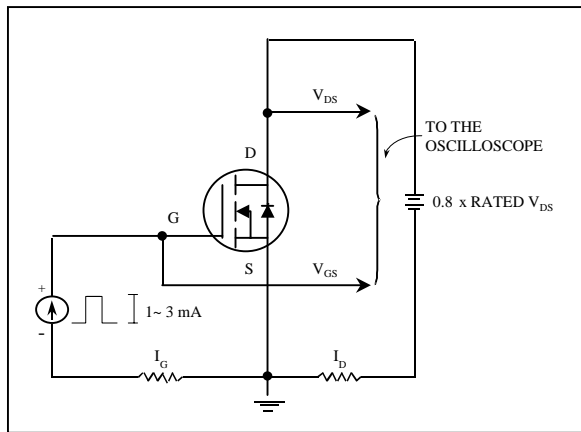


Fig 15. Gate Charge Circuit

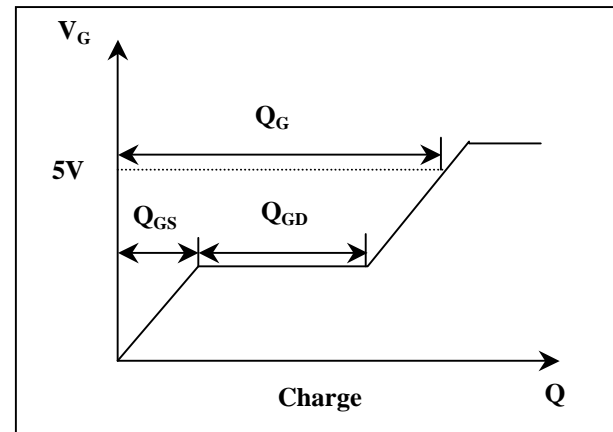


Fig 16. Gate Charge Waveform

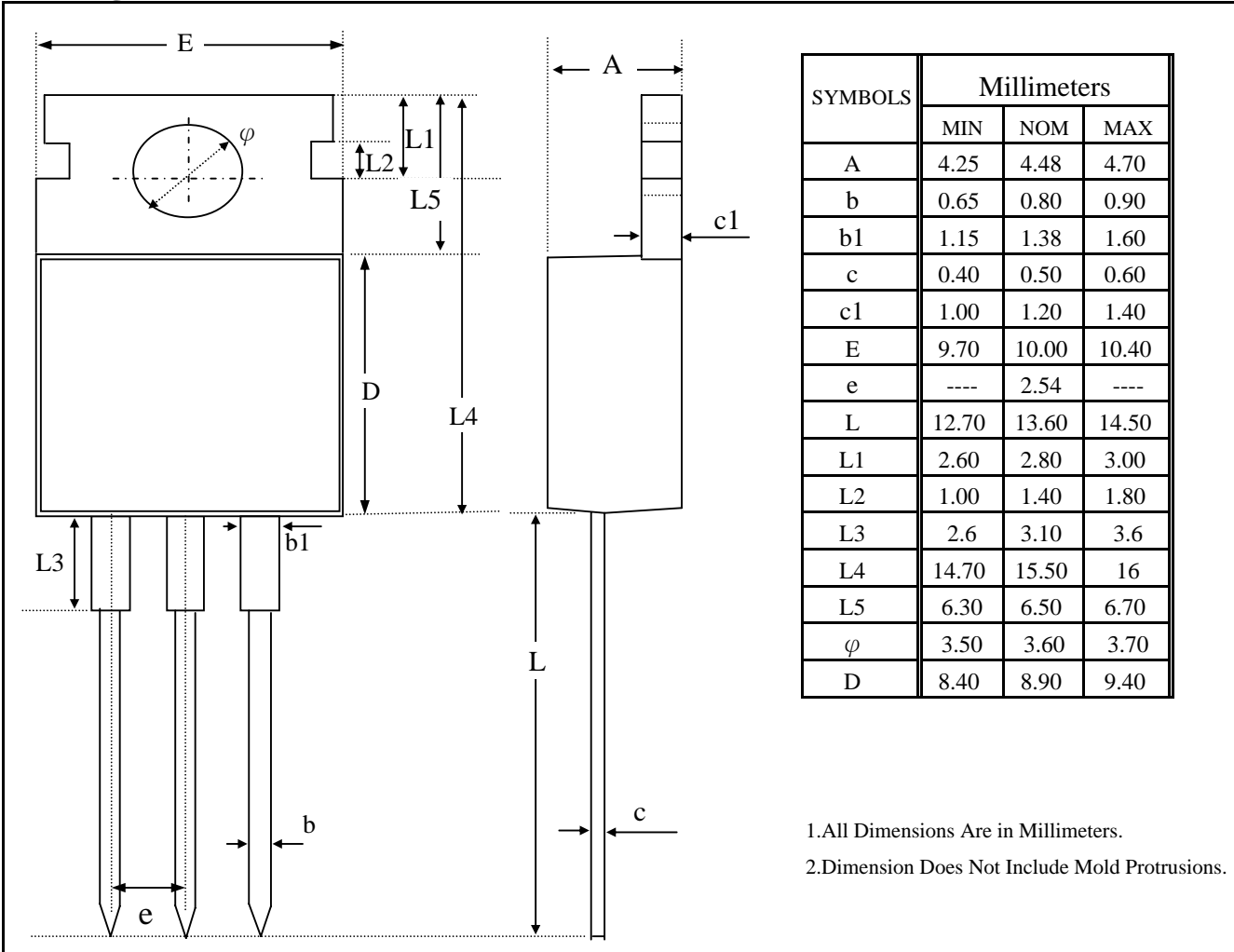


富鼎先進電子股份有限公司

ADVANCED POWER ELECTRONICS CORP.

產品尺寸圖

Package Outline : TO-220



5.2.1 管條(TUBE)之裝箱法

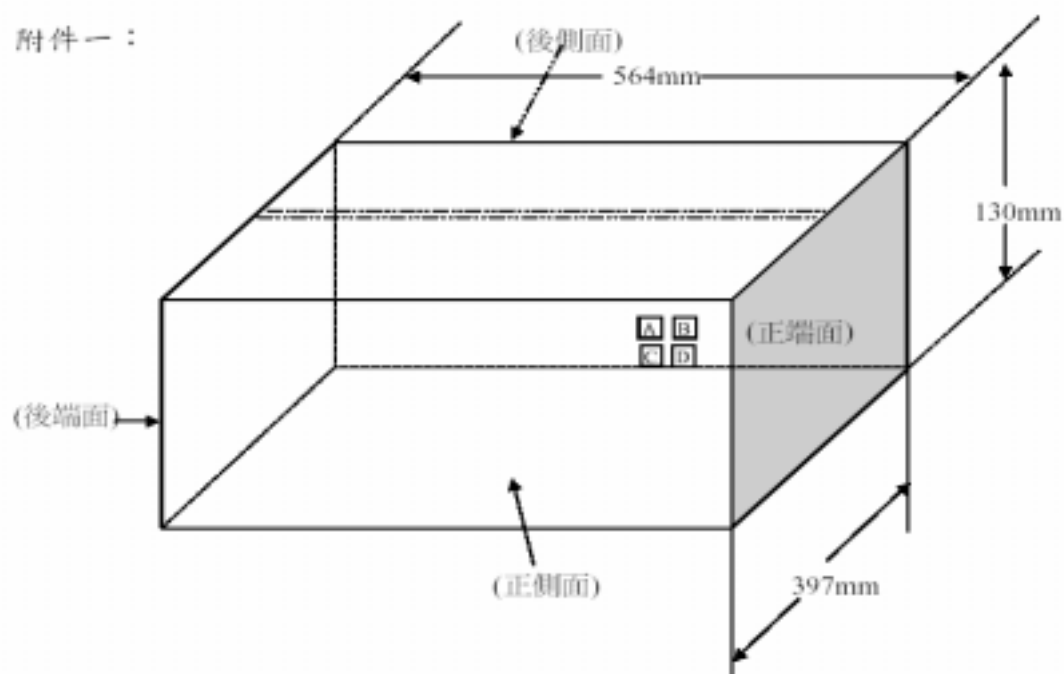
5.2.1.1

產品型式	TO-220	TO-220FM	TO-262	DIP-8
單管數量	50ea	50ea	50ea	50ea
內盒數量	1000ea/Box	1000ea/Box	1000ea/Box	3000ea/Box
外箱數量	6000ea/carton	6000ea/carton	6000ea/carton	12000ea/carton
外箱尺寸	附件(一)	附件(一)	附件(一)	附件(五)

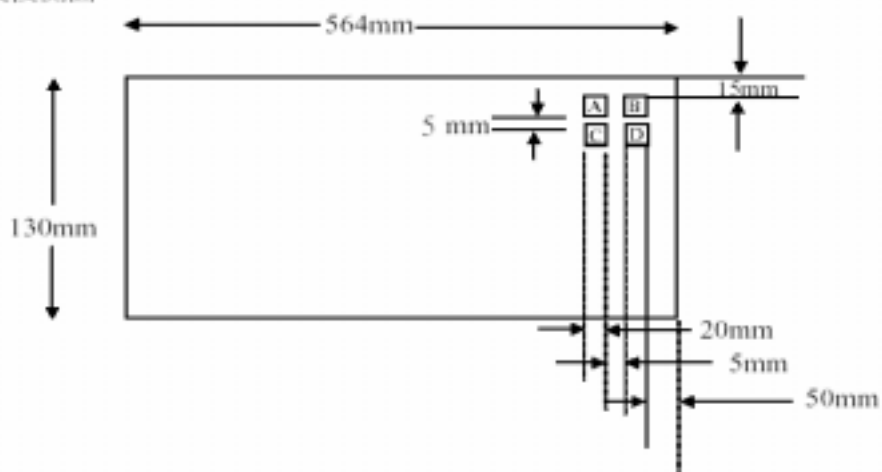
5.2.1.2 尾數箱裝箱時需將剩餘空間，以小內盒或氣泡膠填充之。

TO-220、TO-220FM & TO-262外箱尺寸規格(For Tube)

附件一：



(一)正側面及後側面



5.2.3 靜電袋之裝箱法

產品型式	TO-220	TO-251/TO-92
單包數量	50ea	100ea
內盒數量	500ea/box	10000ea/box
外箱數量	4000ea/carton	40000ea/carton
外箱尺寸	附件(三)	附件(四)

5.2.3.2 尾數箱裝箱時需將剩餘空間，以小內盒氣泡膠填充之。

