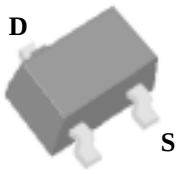
AP2311GN

Pb Free Plating Product

Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Simple Drive Requirement**
- ▼ **Small Package Outline**
- ▼ **Surface Mount Device**
- ▼ **RoHS Compliant**



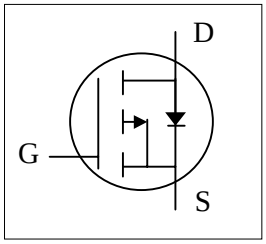
SOT-23

BV_{DSS}	-60V
$R_{DS(ON)}$	250mΩ
I_D	- 1.8A

Description

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

The SOT-23 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current[3]	- 1.8	A
I_D@T_A=70℃	Continuous Drain Current[3]	- 1.4	A
I_{DM}	Pulsed Drain Current[1,2]	-10	A
P_D@T_A=25℃	Total Power Dissipation	1.38	W
	Linear Derating Factor	0.01	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter		Value	Unit
Rthj-a	Thermal Resistance Junction-ambient[3]	Max.	90	℃/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	-60	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=-1mA	-	-0.04	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-1.8A	-	200	250	mΩ
		V_{GS}=-4.5V, I_D=-1.4A	-	240	300	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=-1A	-	2	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=-60V, V_{GS}=0V	-	-	-10	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=-48V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-1A	-	6	10	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-48V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	3	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-30V	-	8	-	ns
t_r	Rise Time	I_D=-1A	-	5	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=-10V	-	22	-	ns
t_f	Fall Time	R_D=30Ω	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	510	810	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	50	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	40	-	pF
R_g	Gate Resistance	f=1.0MHz	-	6.4	9.6	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-1.2A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time[2]	I_S=-1A, V_{GS}=0V,	-	30	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	38	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

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

3.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤10sec ; 270 ℃/W when mounted on Min. copper pad.

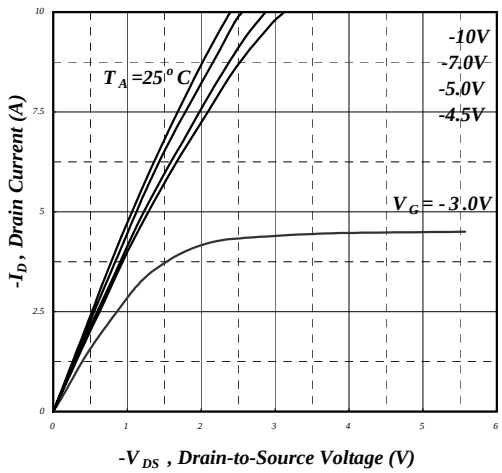


Fig 1. Typical Output Characteristics

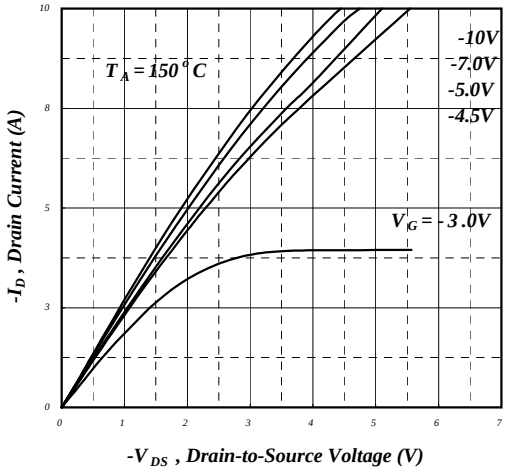


Fig 2. Typical Output Characteristics

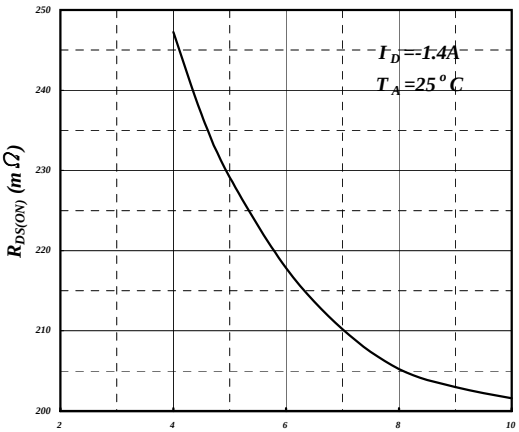


Fig 3. On-Resistance v.s. Gate Voltage

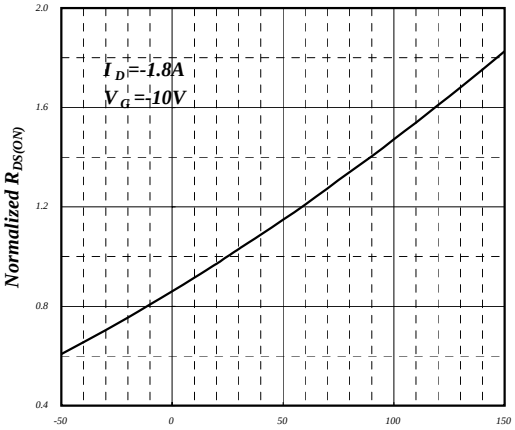


Fig 4. Normalized On-Resistance v.s. Junction Temperature

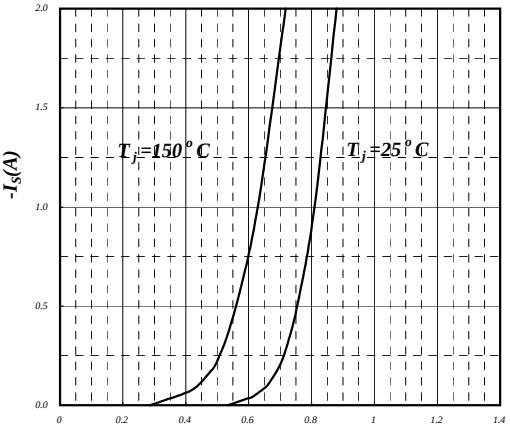


Fig 5. Forward Characteristic of

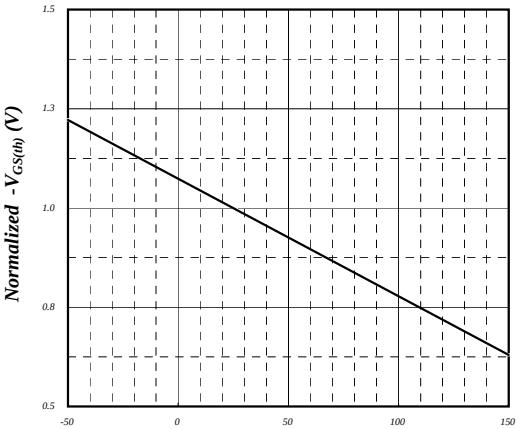


Fig 6. Gate Threshold Voltage v.s.

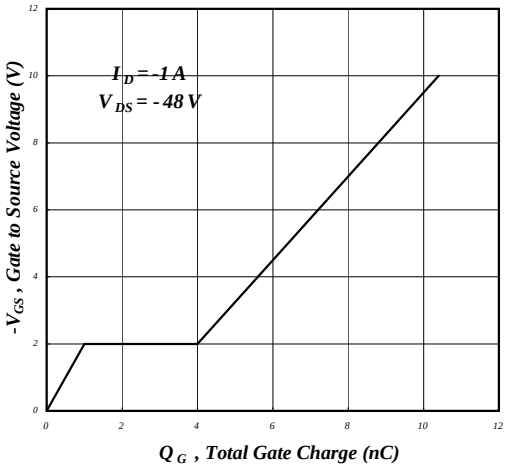


Fig 7. Gate Charge Characteristics

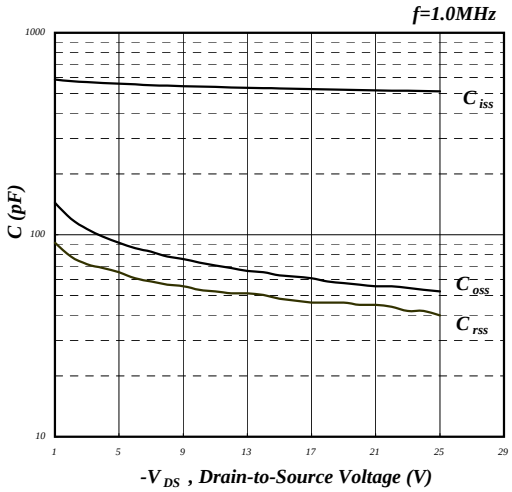


Fig 8. Typical Capacitance Characteristics

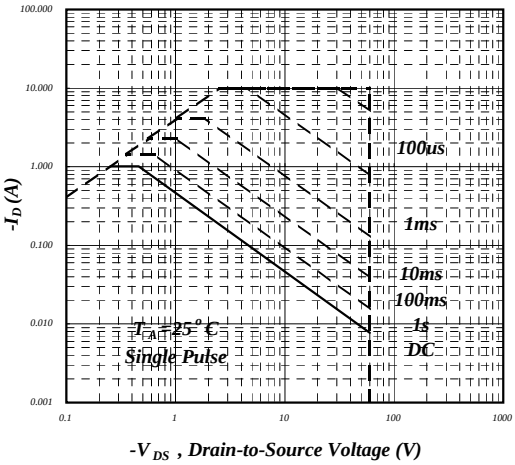


Fig 9. Maximum Safe Operating Area

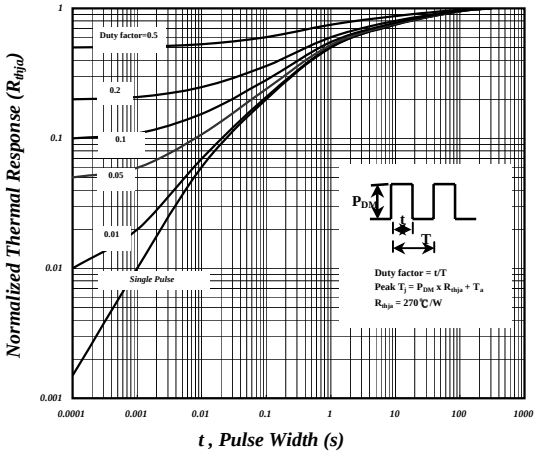


Fig 10. Effective Transient Thermal Impedance

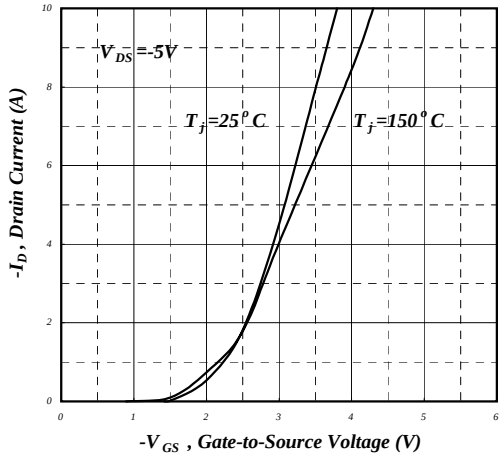


Fig 11. Transfer Characteristics

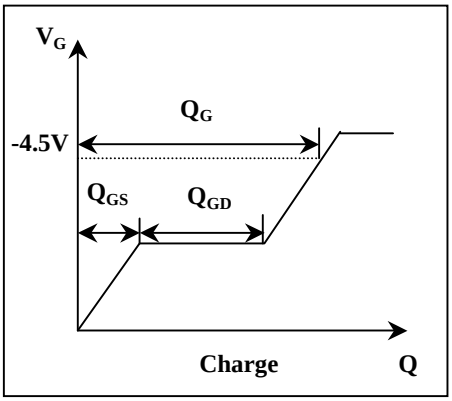
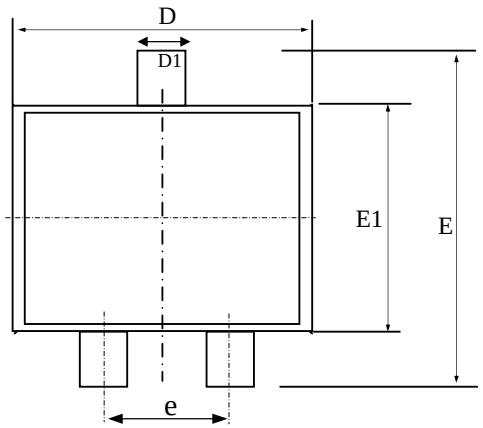
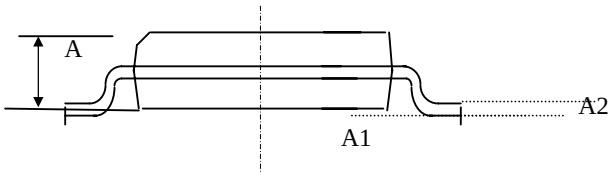


Fig 12. Gate Charge Circuit

Package Outline : SOT-23



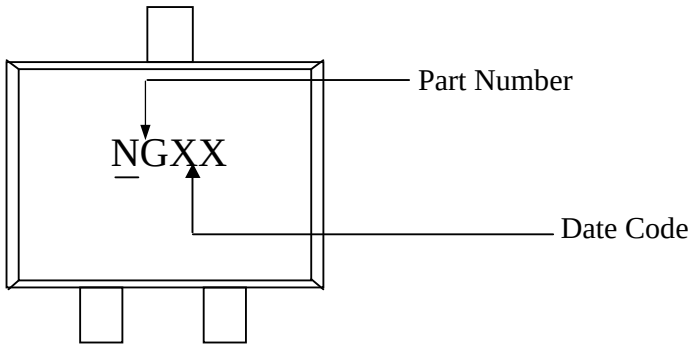
	Millimeters		
SYMBOLS	MIN	NOM	MAX
A	1.00	1.15	1.30
A1	0.00	--	0.10
A2	0.10	0.15	0.20
D1	0.30	0.40	0.50
e	1.70	2.00	2.30
D	2.70	2.90	3.10
E	2.40	2.65	2.90
E1	1.40	1.50	1.60



1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : SOT-23



*Packing (antistatic)
Reel：3000pcs/reel；5reel/box；10box/carton

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包裝規範

5.2.2.1

產品型式	TO-252/SOT-223	TO-263	SO-8/TSSOP-8	SOT-23	SOT-89
單捲數量	3000ea	800ea	3000ea	3000ea	1000ea
內盒數量	6000ea/Box	800ea/box	6000ea/box	15000ea/box	5000ea/box
外箱數量	24000ea/carton	4000ea/carton	24000 or 48000ea/carton	150000ea/carton	50000ea/carton
外箱尺寸	附件(二)	附件(二)	附件(六)	附件(二)	附件(二)
圓盤規格	附圖一/附圖六	附圖三	附圖二	附圖四	附圖五

5.2.2.2 尾數箱裝箱時需將剩餘空間，以小內盒或氣泡膠填充之。

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。

5.3 不同產品不可裝入同一箱子內，以避免產品混料。

5.4 包裝箱標籤：整貨裝箱後將型號數量標籤(如附件五)貼在紙箱及小內盒側面。

5.5 包裝檢驗：裝箱完成後通知 QA 檢驗，檢驗合格則蓋上檢查合格章後等待出貨。

6.相關文件：無

7.使用表單：無

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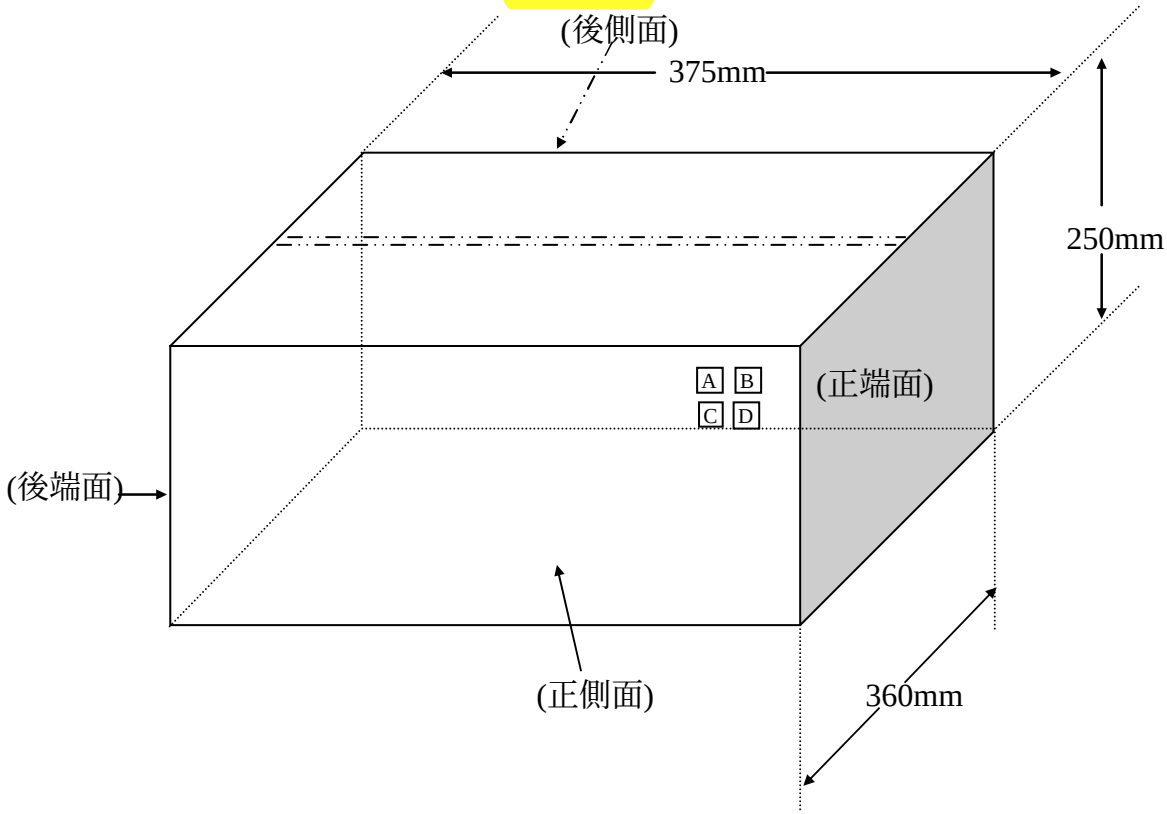
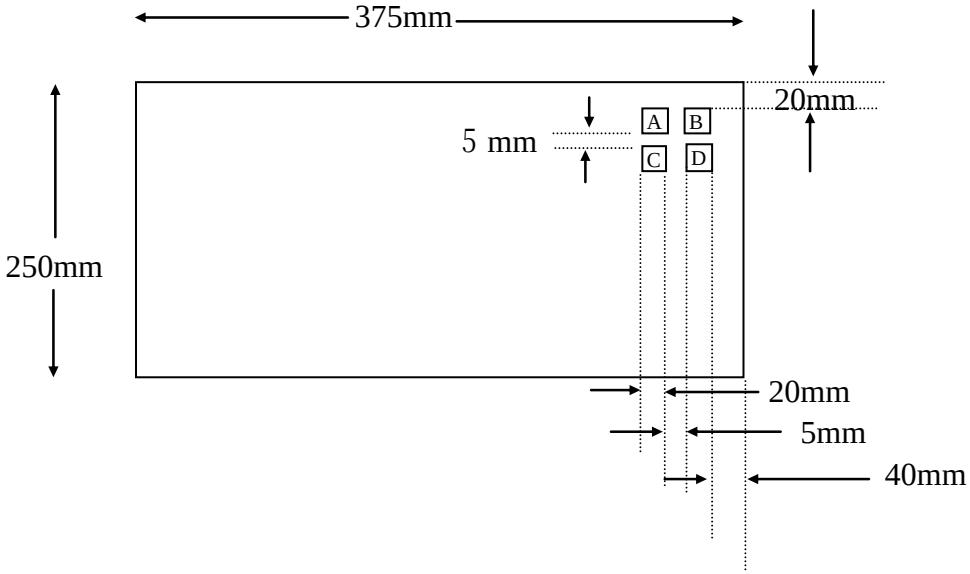
包裝規範

附件二：　　TO-252 、TO-263、SOT-23、SOT-89 & SOT-223



(一)正側面及後側面



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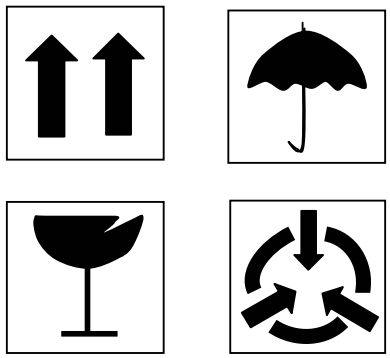
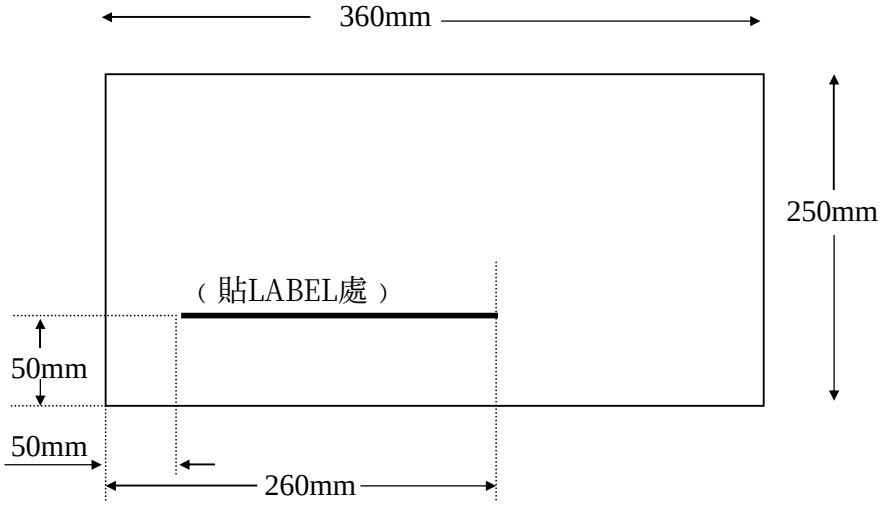
1.A、B、C、D為警告標誌，各20mm*20mm

（一）圖案如下：TO-252 、 TO-263、 SOT-23、 SOT-89 & SOT-223



（二）正端面



1.LABEL 下緣與標線貼齊
2.標線尺寸1.5mm*210mm

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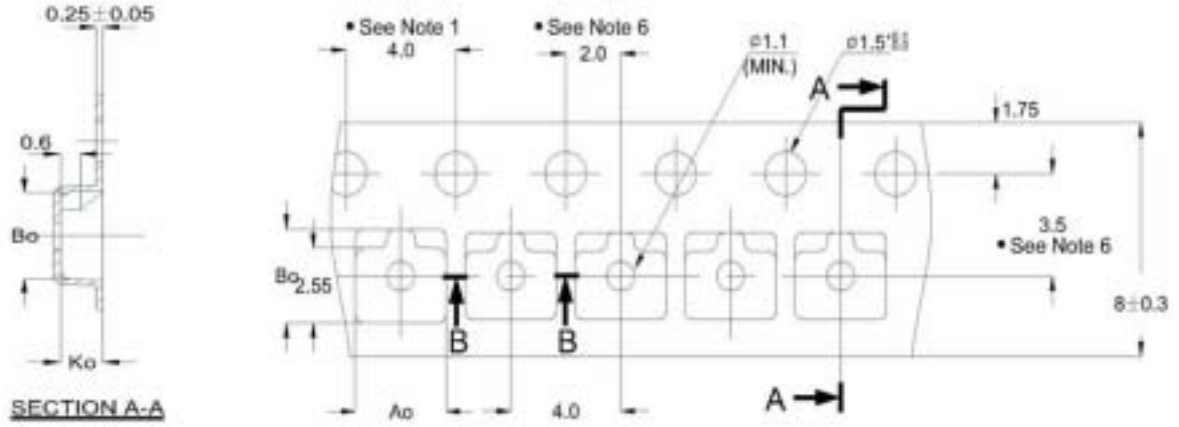
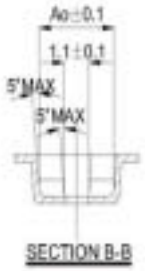
包裝規範

附圖四：

SOT-23 Tape & Reel Information

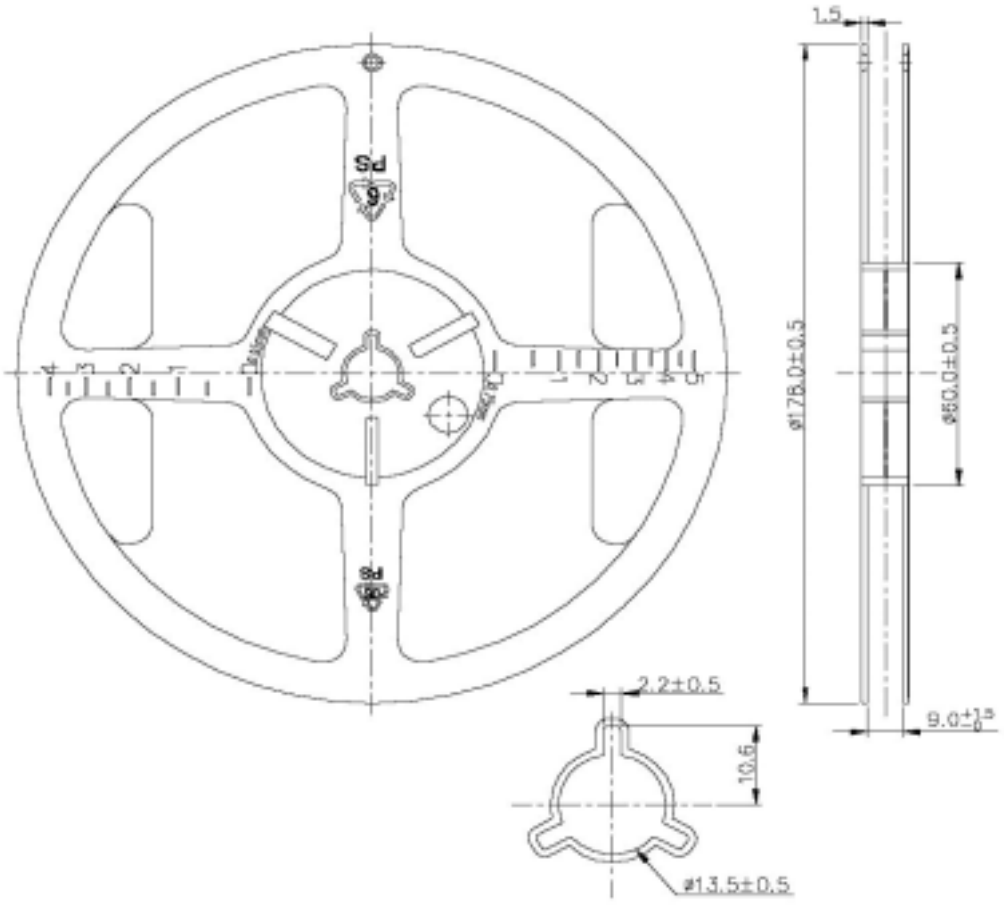




Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2
2. Camber not to exceed 1mm in 100mm.
3. Material: Black Advantek Polystyrene.
4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Ao=3.30mm
Bo=3.20mm
Ko=1.47mm



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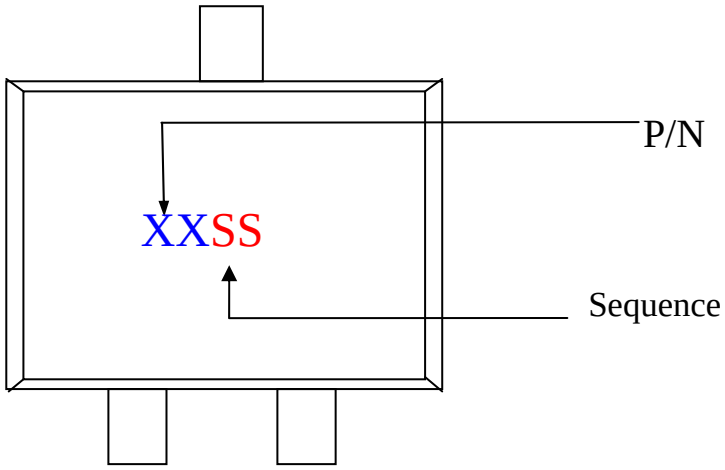
ADVANCED POWER ELECTRONICS CORP.

SOT Series D/C Description



(1) "XX" is the P/N code

(2) " SS " is the Sequence:
當 S 為阿拉伯數字 "1～9 或小寫 a-z" 代表流水編號,即代表當週第幾生產批
當 S 為大寫之" A-Z" 代表週別碼,如於第三碼則為 1-26 週,如於第四碼則 27-52 週

(3) Add the under line in first Alphabet for Pb-free Product.

Ex(1)Y5B1:mean AP2605Y mean the first lot produce in the second week

(2)Y52B: mean AP2605Y mean the second lot produce in the 28th week

(3) Y5B1:mean AP2605Y produce in the second week for Pb-free product.

SOT Series Year Code

X X S S	2004,2008,2012…	XXSS	2005,2009,2013…
X X S S	2006,2010,2014…	X X S S	2007,2011,2015…

4 years in one cycle

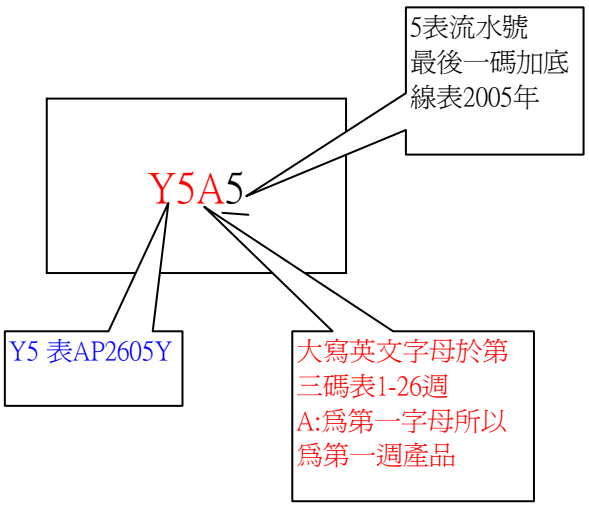
EX:Y5B2 :表示2004年第二週第二批之產品

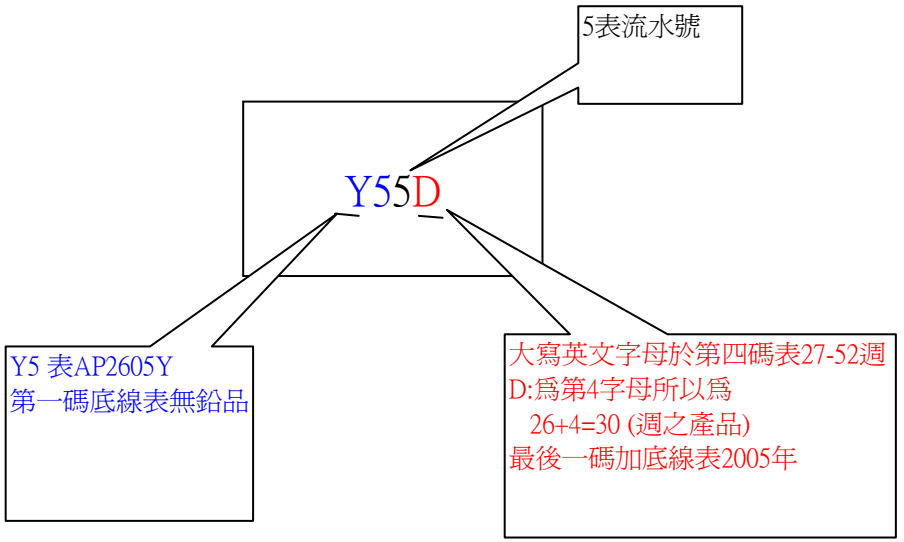
EX:Y5B2 :表示2005年第二週第二批之產品

EX:Y5B2 :表示2006年第二週第二批之產品

EX:Y5B2 :表示2007年第二週第二批之產品

SOT- D/C 說明


5表流水號
最後一碼加底
線表2005年
Y5A5
Y5 表AP2605Y
大寫英文字母於第
三碼表1-26週
A:爲第一字母所以
爲第一週產品

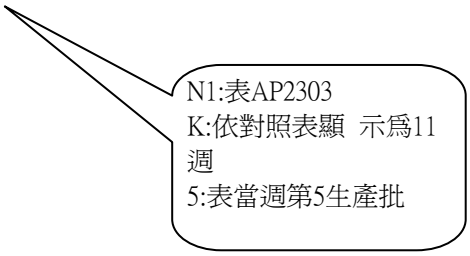

5表流水號
Y55D
Y5 表AP2605Y
第一碼底線表無鉛品
大寫英文字母於第四碼表27-52週
D:爲第4字母所以爲
26+4=30 (週之產品)
最後一碼加底線表2005年

原廠商:APEC

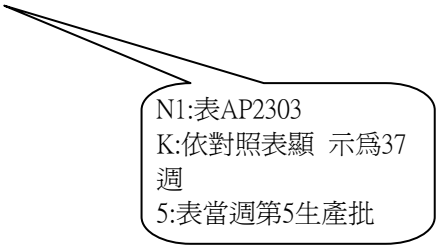
此D/C編碼適應範圍:SOT-23、SOT-26

D/C欄位的第一、二碼表示P/N
D/C欄位的第三、四碼表示週別&流水碼

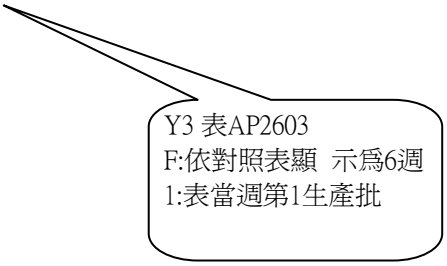
EX:
D/C: N3K5



D/C:N35K



D/C:Y3F1



大寫英文字母於第三碼	對應週別	大寫英文字母於第四碼	對應週別
A	1	A	27
B	2	B	28
C	3	C	29
D	4	D	30
E	5	E	31
F	6	F	32
G	7	G	33
H	8	H	34
I	9	I	35
J	10	J	36
K	11	K	37
L	12	L	38
M	13	M	39
N	14	N	40
O	15	O	41
P	16	P	42
Q	17	Q	43
R	18	R	44
S	19	S	45
T	20	T	46
U	21	U	47
V	22	V	48
W	23	W	49
X	24	X	50
Y	25	Y	51
Z	26	Z	52