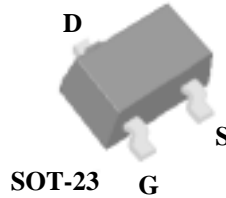




- ▼ Simple Drive Requirement
- ▼ Small Package Outline
- ▼ Surface Mount Device

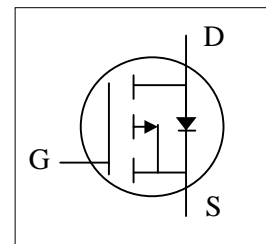


$BV_{DSS}$	-16V
$R_{DS(ON)}$	60m $\Omega$
$I_D$	- 4A

## 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	-16	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current <sup>3</sup>	-4	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current <sup>3</sup>	-3.3	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-12	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	1.38	W
	Linear Derating Factor	0.01	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-a	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 90	$^\circ C/W$



# AP2307GN

## Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-16	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	-	-0.01	-	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	-	-	60	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.0A	-	-	70	mΩ
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.0A	-	-	90	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-	-	-1.0	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-4A	-	12	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-	-1	uA
	Drain-Source Leakage Current (T <sub>j</sub> =70°C)	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V	-	-	-25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±8V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =-4A	-	15	24	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-12V	-	1.3	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	4	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =-10V	-	8	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	11	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =-10V	-	54	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =10Ω	-	36	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	985	1580	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-15V	-	180	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	160	-	pF

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =-1.2A, V <sub>GS</sub> =0V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =-4A, V <sub>GS</sub> =0V,	-	39	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs	-	26	-	nC

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board ; 270°C/W when mounted on min. copper pad.

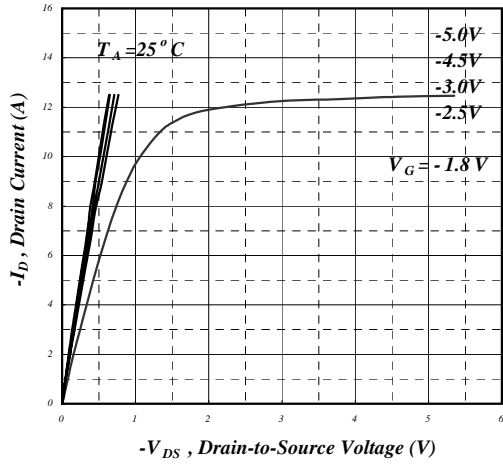


Fig 1. Typical Output Characteristics

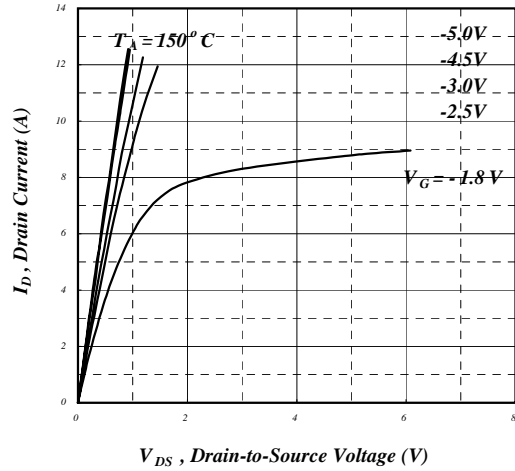


Fig 2. Typical Output Characteristics

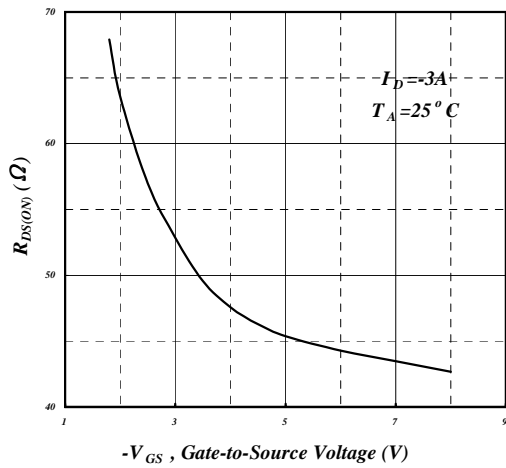


Fig 3. On-Resistance v.s. Gate Voltage

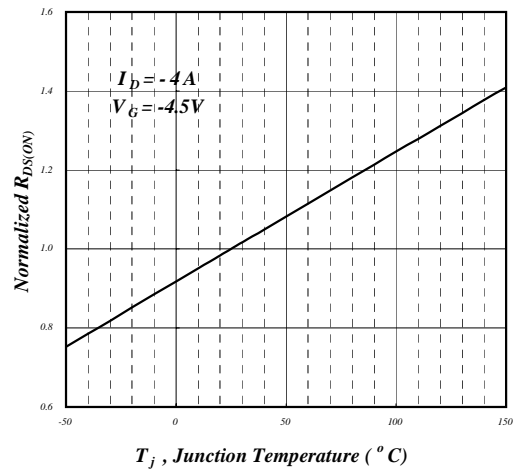


Fig 4. Normalized On-Resistance v.s. Junction Temperature

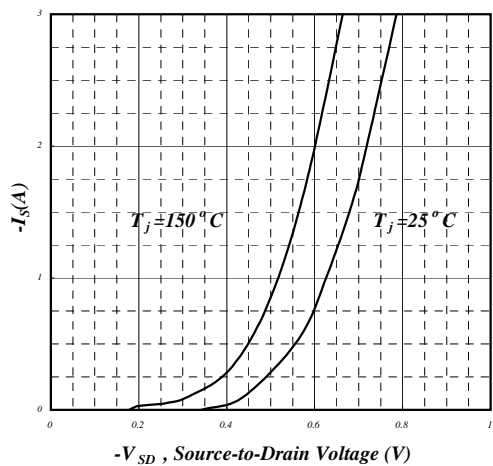


Fig 5. Forward Characteristic of Reverse Diode

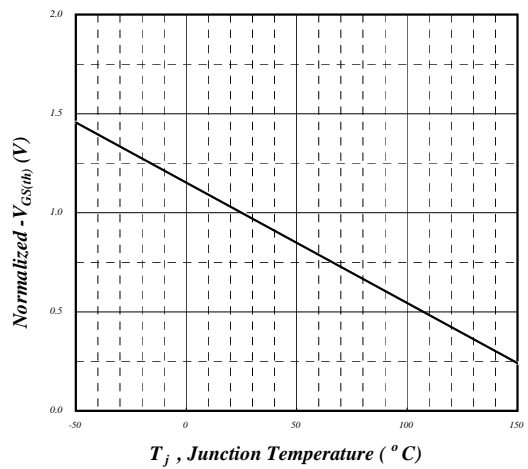


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

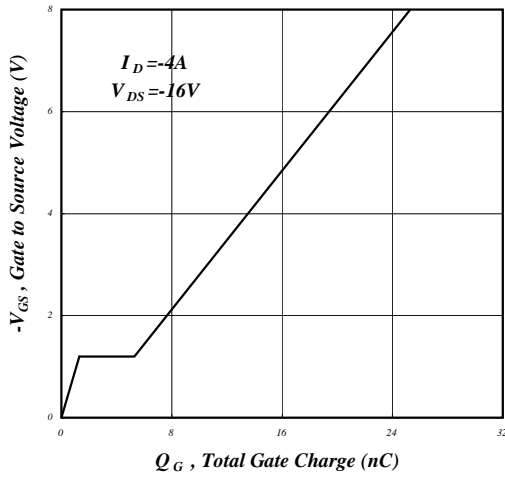


Fig 7. Gate Charge Characteristics

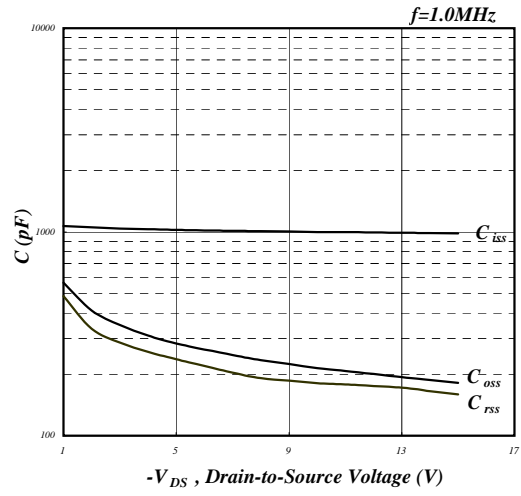


Fig 8. Typical Capacitance Characteristics

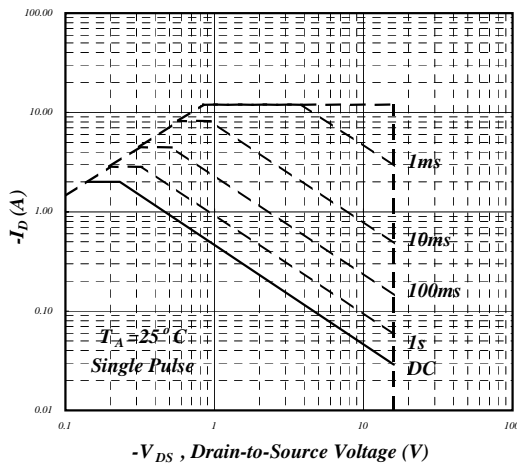


Fig 9. Maximum Safe Operating Area

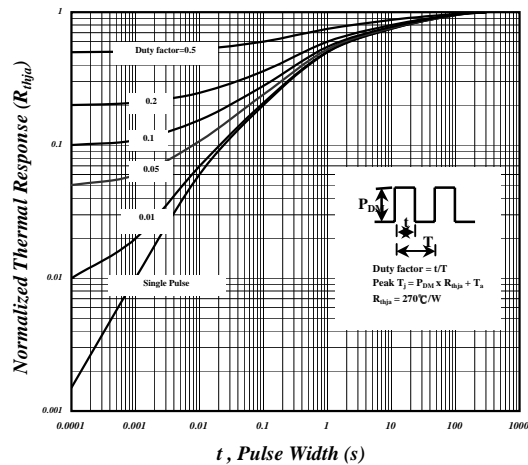


Fig 10. Effective Transient Thermal Impedance

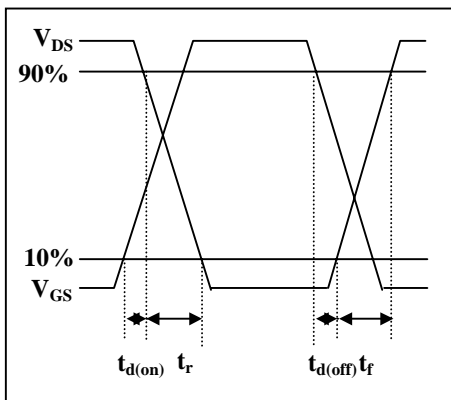


Fig 11. Switching Time Waveform

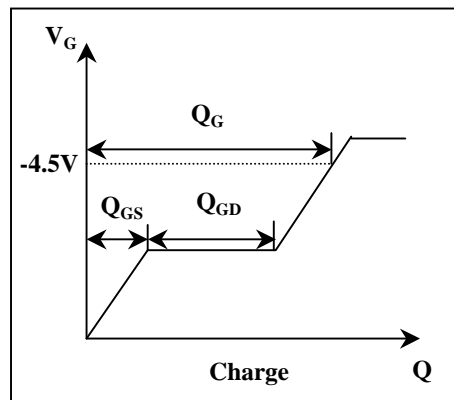
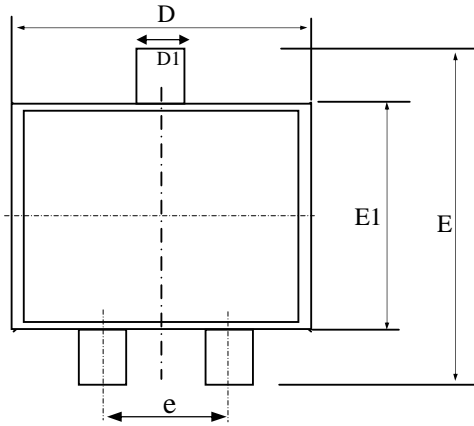


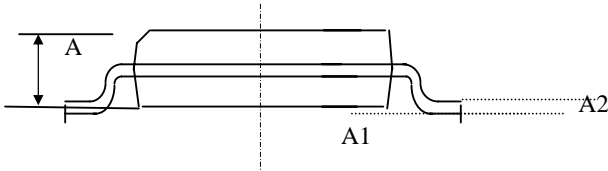
Fig 12. Gate Charge Waveform

富鼎先進電子股份有限公司  
Package產品尺寸圖

Package Outline : SOT-23

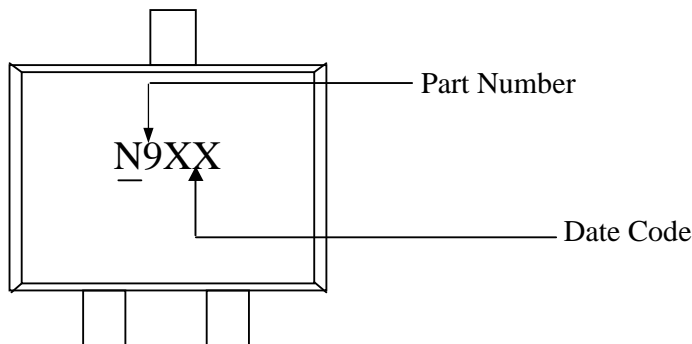


SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	1.00	1.15	1.30
A1	0.00	--	0.10
A2	0.10	0.15	0.20
D1	0.30	0.40	0.50
e	1.70	2.00	2.30
D	2.70	2.90	3.10
E	2.40	2.65	2.90
E1	1.40	1.50	1.60



- 1.All Dimension Are In Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : SOT-23



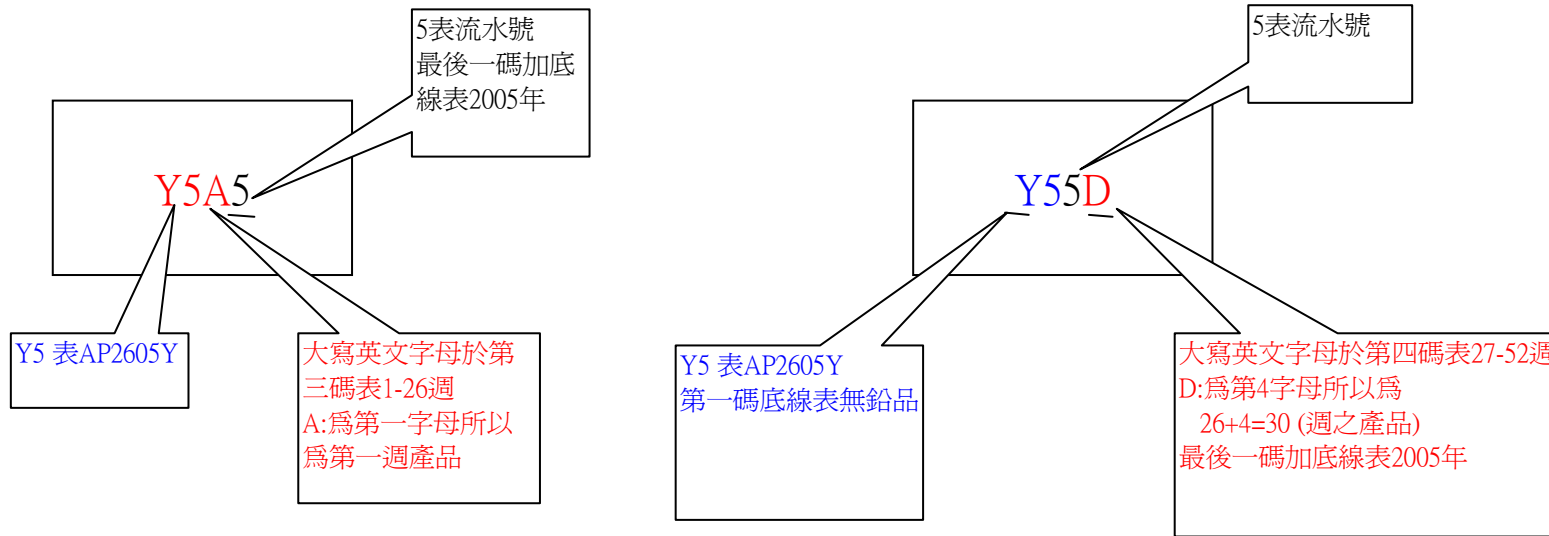
\*Packing (antistatic)  
Reel : 3000pcs/reel ; 5reel/box ; 10box/carton

SOT Series Year Code			
<div style="border: 1px solid black; padding: 5px; display: inline-block;">X X S S</div>	2004,2008,2012...	<div style="border: 1px solid black; padding: 5px; display: inline-block;">XXSS</div>	2005,2009,2013...
<div style="border: 1px solid black; padding: 5px; display: inline-block;">X X <u>S</u> S</div>	2006,2010,2014...	<div style="border: 1px solid black; padding: 5px; display: inline-block;">X X <u>S</u> <u>S</u></div>	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



# 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

N1:表AP2303  
K:依對照表顯示為11週  
5:表當週第5生產批

D/C:N35K

N1:表AP2303  
K:依對照表顯示為37週  
5:表當週第5生產批

D/C:Y3F1

Y3 表AP2603  
F:依對照表顯示為6週  
1:表當週第1生產批

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