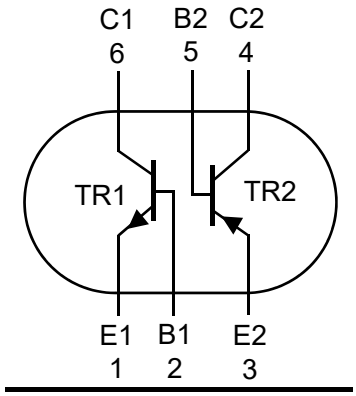
Prisemi®

PDT236T4140

NPN/PNP Transistor

Feature

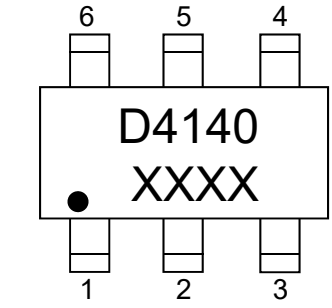
- 800mW total power dissipation
- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- Replaces two SOT23 packaged low V_{CEsat} transistors on same PCB area
- Reduces required PCB area
- Reduced pick and place costs



Circuit Diagram

Applications

- General purpose switching and muting
- LCD backlighting
- Supply line switching circuits
- Battery driven equipment (mobile phones, video cameras and hand-held devices)



Marking (Top View)

Quick reference data

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Per transistor unless otherwise specified, for the PNP transistor with negative polarity						
Collector-emitter Voltage	V_{CEO}	open base	-	-	40	V
Collector Current	I_C	-	-	-	1.0	A
Peak Collector Current	I_{CM}	single pulse,t_p≤1ms	-	-	2.0	A
TR1 (NPN)						
Collector-emitter Saturation Resistance	R_{CEsat}	I_C=500mA,I_B=50mA, pulsed,t_p≤300μs,δ≤0.02, T_{amb}=25℃	-	103	300	mΩ
TR2 (PNP)						
Collector-emitter Saturation Resistance	R_{CEsat}	I_C=-500mA,I_B=-50mA, pulsed,t_p≤300μs,δ≤0.02, T_{amb}=25℃	-	175	300	mΩ

Absolute maximum rating@25℃

Parameter	Symbol	Value	Units
Per transistor unless otherwise specified, for the PNP transistor with negative polarity			
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5.0	V
Collector Current	I_C	1.0	A
Peak Collector Current @ single pulse, t_p ≤1ms	I_{CM}	2.0	A
Peak Base Current @ single pulse, t_p ≤1ms	I_{BM}	1.0	A
Total Power Dissipation @ T_{amb}≤25℃ [1)]	P_{tot}	370	mW
Per device			
Total Power Dissipation @ T_{amb}≤25℃ [1)]	P_{tot}	800	mW
Junction Temperature	T_J	150	℃
Ambient Temperature	T_{amb}	-65 ~ +150	℃
Storage Temperature	T_{STG}	-65 ~ +150	℃

Note
1.Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout

Thermal Characteristics

Parameter	Symbol	Value	Units
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	154.8	K/W

Electrical characteristics per line@25℃

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Per transistor unless otherwise specified, for the PNP transistor with negative polarity						
Collector-Base Cut-off Current	I_{CBO}	V_{CB}=40V,I_E=0A,T_{amb}=25℃	-	-	100	nA
		V_{CB}=40V,I_E=0A,T_j=150℃	-	-	50	μA
Collector-Emitter Cut-off Current (base open)	I_{CEO}	I_B=0A,V_{CE}=30V	-	-	100	nA
Emitter-Base Cut-off Current	I_{EBO}	V_{EB}=5V,I_C=0A,T_{amb}=25℃	-	-	100	nA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=100mA,I_B=1mA,T_{amb}=25℃	-	42	100	mV
		I_C=500mA,I_B=50mA,T_{amb}=25℃	-	51	150	
		I_C=1A,I_B=100mA,T_{amb}=25℃	-	92	300	

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
TR1 (NPN)						
DC Current Gain	h_{FE}	V_{CE}=5V,I_C=1mA,T_{amb}=25℃	300	700	-	
		V_{CE}=5V,I_C=500mA,T_{amb}=25℃	300	540	900	
		V_{CE}=5V, I_C=1A,T_{amb}= 25℃	200	450	-	
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	I_C=500mA,I_B=50mA,pulsed, t_p≤300μs,δ≤0.02,T_{amb}=25℃	-	100	400	mΩ
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1A,I_B =100mA,T_{amb}=25℃	-	0.9	1.3	V
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	V_{CE} =5V,I_C=1A, T_{amb}=25℃	-	0.9	1.1	V
Transition Frequency	f_T	V_{CE}=10V,I_C=50mA,f=100MHz, T_{amb}=25℃	150	-	-	MHz
Collector Capacitance	C_C	V_{CB}=10V,I_E=0A, f=1MHz, T_{amb}=25℃	-	-	10	pF
TR2 (PNP)						
DC Current Gain	h_{FE}	V_{CE}=-5V,I_C=-1mA,T_{amb}=25℃	300	440	-	
		V_{CE}=-5V,I_C=-100mA,T_{amb}=25℃	300	400	800	
		V_{CE}=-5V,I_C=-500mA,T_{amb}=25℃	250	315	-	
		V_{CE}=-5V, I_C=-1A,T_{amb}= 25℃	160	250	-	
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	I_C=-500mA,I_B=-50mA,pulsed, t_p≤300μs,δ≤0.02,T_{amb}=25℃	-	174	400	mΩ
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=-1A,I_B=-50mA,T_{amb}=25℃	-	-	-0.9	V
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	V_{CE} =-5V,I_C=-1A, T_{amb}=25℃	-	-	-0.9	V
Transition Frequency	f_T	V_{CE}=-10V,I_C=-50mA, f=100MHz,T_{amb}=25℃	150	-	-	MHz
Collector Capacitance	C_C	V_{CB}=-10V,I_E=0A, f=1MHz, T_{amb}=25℃	-	-	12	pF

Typical Characteristics(NPN)

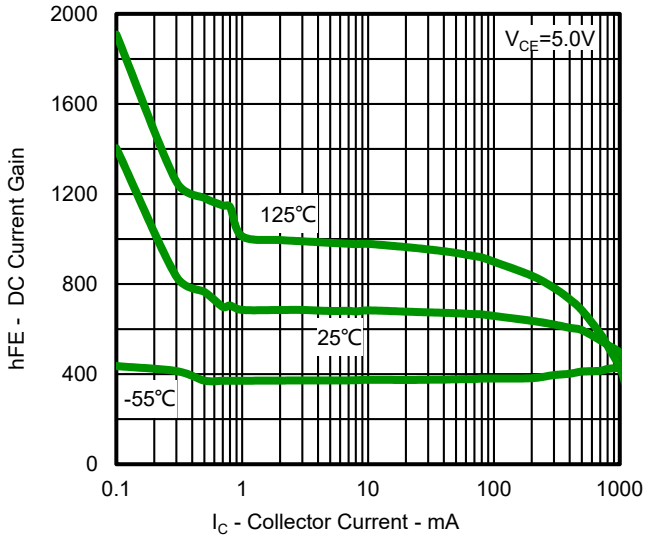


Fig.1 hFE - I_C

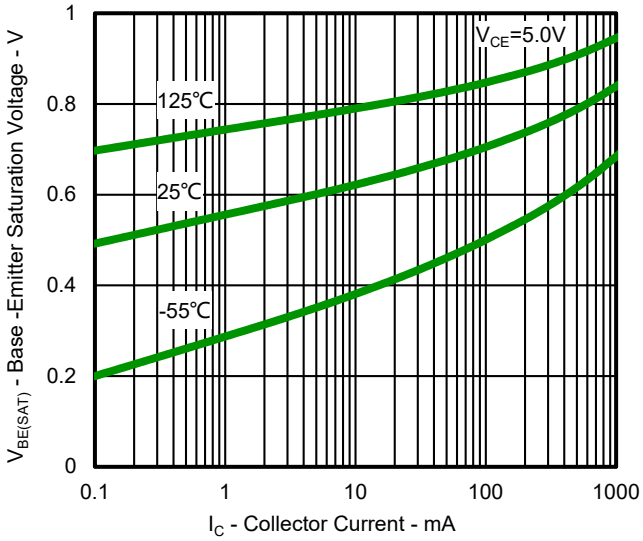


Fig.2 $V_{BE(SAT)}$ - I_C

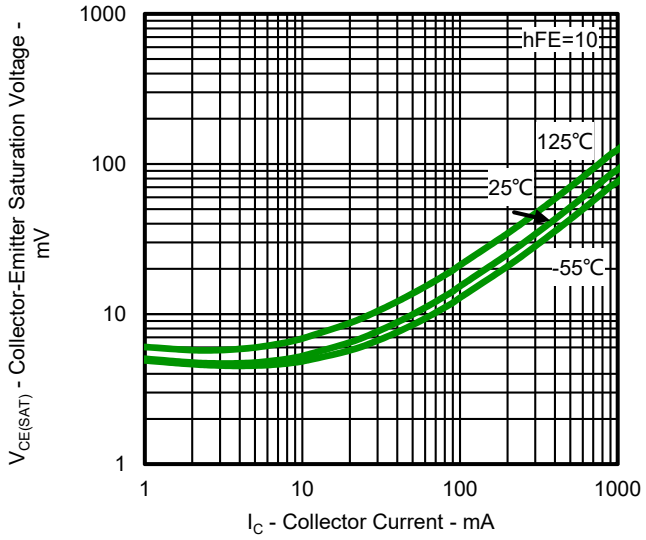


Fig.3 $V_{CE(SAT)}$ - I_C

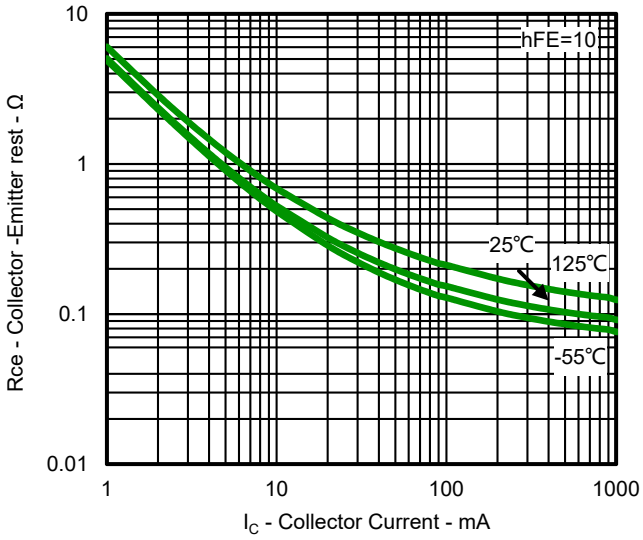


Fig.4 R_{CE}- I_C

Typical Characteristics(PNP)

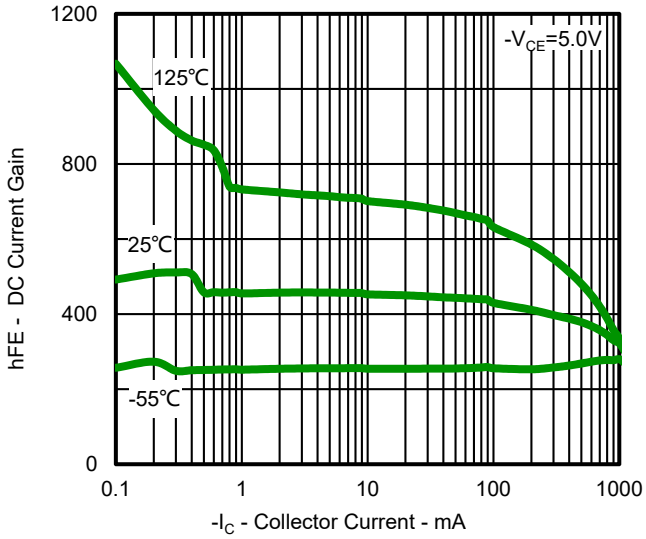


Fig.1 hFE - I_C

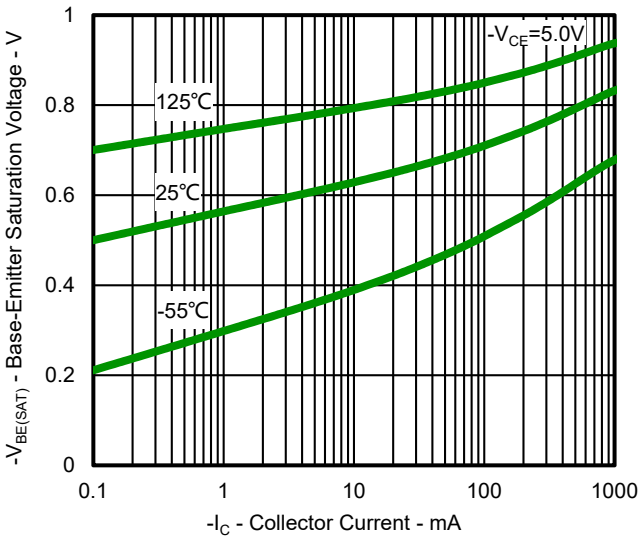


Fig.2 $-V_{BE(SAT)}$ - $-I_C$

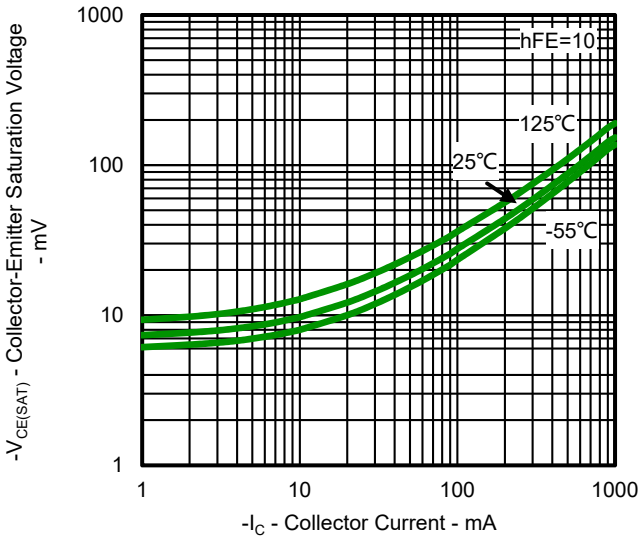


Fig.3 $-V_{CE(SAT)}$ - $-I_C$

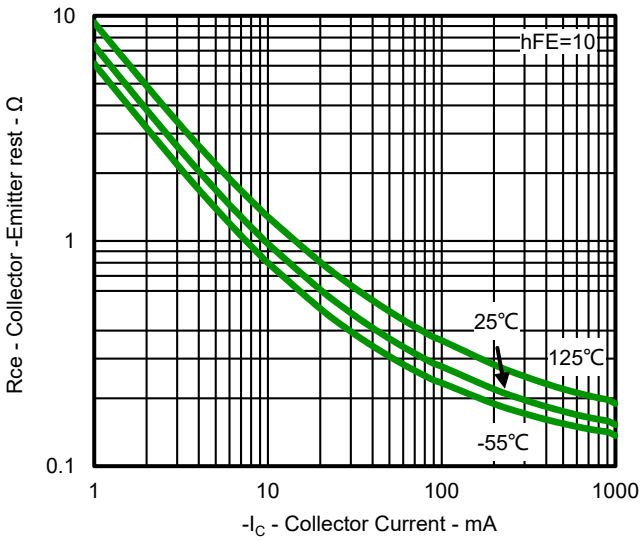
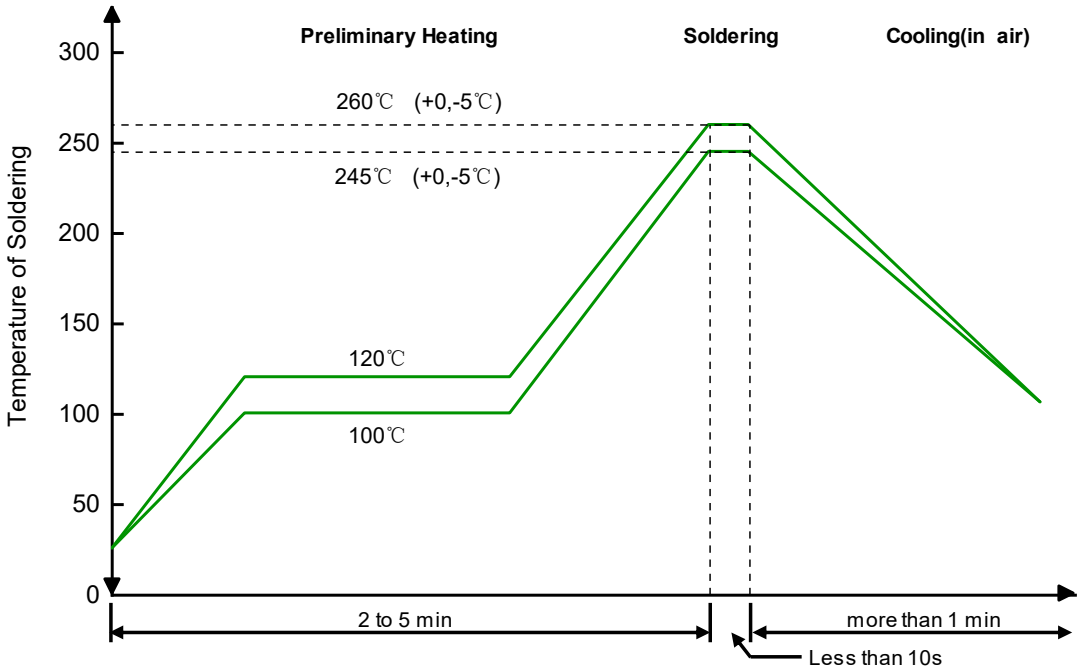


Fig.4 R_{CE}- $-I_C$

Solder Reflow Recommendation

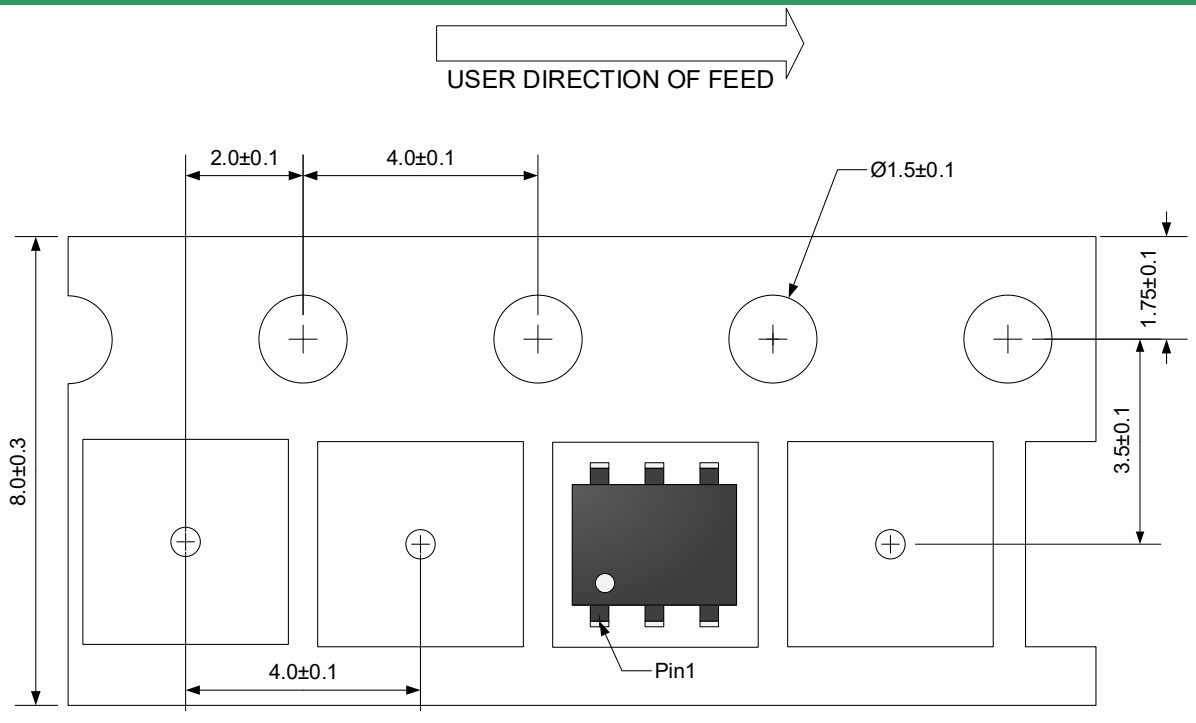


Remark: Pb free for 260℃; Pb for 245℃.

Ordering Information

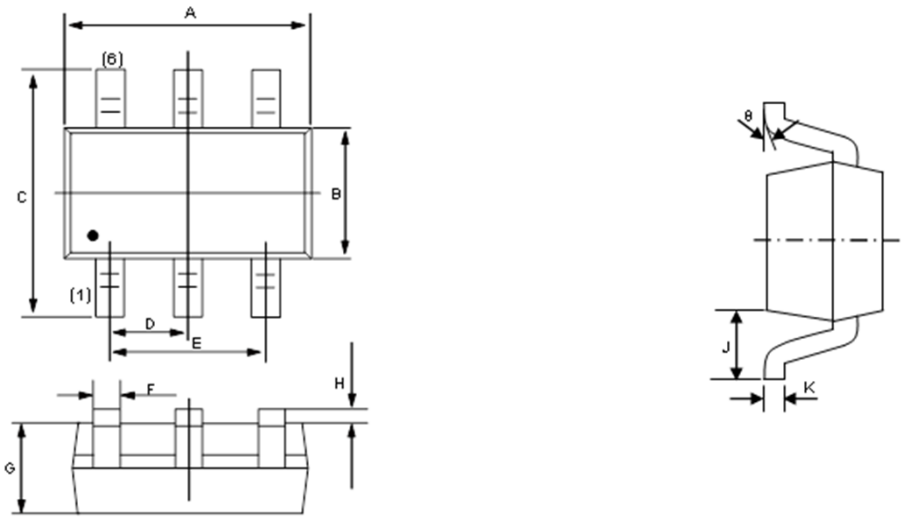
Package	Reel	Shipping
SOT23-6L	7"	3000 / Tape & Reel

Load With Information

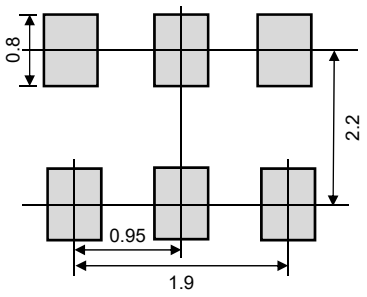


Unit:mm

Product Dimension (SOT23-6L)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	2.72	3.12	0.107	0.123
B	1.40	1.80	0.055	0.071
C	2.60	3.00	0.102	0.118
D	0.95 (BSC)		0.037 (BSC)	
E	1.70	2.10	0.067	0.083
F	0.30	0.50	0.012	0.020
G	1.00	1.25	0.039	0.049
H	0.00	0.15	0.000	0.006
J	0.45	0.75	0.018	0.030
K	0.10	0.20	0.004	0.008
θ	0°	15°	0°	15°



Unit: mm

Suggested PCB Layout

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