

PNP SWITCHING SILICON TRANSISTOR

Qualified per MIL-PRF-19500/350

Devices

2N3867
2N3867S

2N3868
2N3868S

Qualified Level

JAN
JANTX
JANTXV

MAXIMUM RATINGS

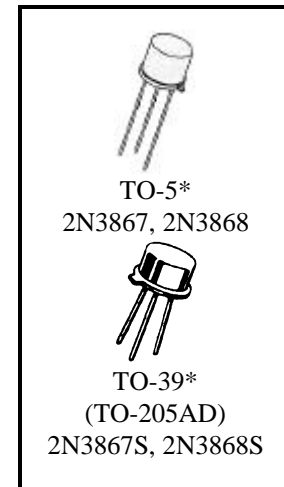
Ratings	Symbol	2N3867 2N3867S	2N3868 2N3868S	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	Vdc
Collector-Base Voltage	V_{CBO}	40	60	Vdc
Emitter-Base Voltage	V_{EBO}	4.0		Vdc
Collector Current -- Continuous	I_C	3.0		Adc
Total Power Dissipation	P_T	@ $T_A = 25^{\circ}\text{C}^{(1)}$	1.0	W
		@ $T_C = 25^{\circ}\text{C}^{(2)}$	10	W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-55 to +200		$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	17.5	$^{\circ}\text{C}/\text{W}$

1) Derate linearly 5.71 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly 57.1 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$



*See Appendix A for
Package Outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Base Breakdown Voltage $I_C = 100 \mu\text{Adc}$	2N3867, S 2N3868, S	$V_{(BR)CBO}$	40 60	Vdc
Collector-Emitter Breakdown Voltage $I_C = 20 \text{mAdc}$	2N3867, S 2N3868, S	$V_{(BR)CEO}$	40 60	Vdc
Emitter-Base Breakdown Voltage $I_E = 100 \mu\text{Adc}$		$V_{(BR)EBO}$	4.0	Vdc
Collector-Emitter Cutoff Current $V_{EB} = 2.0 \text{Vdc}, V_{CE} = 40 \text{Vdc}$ $V_{EB} = 2.0 \text{Vdc}, V_{CE} = 60 \text{Vdc}$	2N3867, S 2N3868, S	I_{CEX}	1.0 1.0	μAdc
Collector-Base Cutoff Current $V_{CB} = 40 \text{Vdc}$ $V_{CB} = 60 \text{Vdc}$	2N3867, S 2N3868, S	I_{CBO}	100	μAdc
Emitter-Base Cutoff Current $V_{EB} = 4 \text{Vdc}$		I_{EBO}	100	μAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio I _C = 500 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3867, S 2N3868, S	h _{FE}	50	200	
I _C = 1.5 A _{dc} , V _{CE} = 2.0 V _{dc} 2N3867, S 2N3868, S		35		
I _C = 2.5 A _{dc} , V _{CE} = 3.0 V _{dc} 2N3867, S 2N3868, S		40		
I _C = 3.0 A _{dc} , V _{CE} = 5.0 V _{dc} All Types		30		
		25		
Collector-Emitter Saturation Voltage I _C = 500 mA _{dc} , I _B = 50 mA _{dc} I _C = 1.5 A _{dc} , I _B = 150 mA _{dc} I _C = 2.5 A _{dc} , I _B = 250 mA _{dc}	V _{CE(sat)}		0.5 0.75 1.5	V _{dc}
Base-Emitter Saturation Voltage I _C = 500 mA _{dc} , I _B = 50 mA _{dc} I _C = 1.5 A _{dc} , I _B = 150 mA _{dc} I _C = 2.5 A _{dc} , I _B = 250 mA _{dc}	V _{BE(sat)}	0.9	1.0 1.4 2.0	V _{dc}

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio I _C = 100 mA _{dc} , V _{CE} = 5.0 V _{dc} , f = 20 MHz	h _{fe}	3.0	12	
Output Capacitance V _{CB} = 10 V _{dc} , I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C _{obo}		120	pF
Input Capacitance V _{EB} = 3.0 V _{dc} , I _C = 0, 100 kHz ≤ f ≤ 1.0 MHz	C _{ibo}		800	pF

SWITCHING CHARACTERISTICS

Delay Time V _{CC} = -30 V _{dc} , V _{EB} = 0,	t _d		35	ns
Rise Time I _C = 1.5 A _{dc} , I _{B1} = 150 mA _{dc}	t _r		65	ns
Storage Time V _{CC} = -30 V _{dc} , V _{EB} = 0,	t _s		500	ns
Fall Time I _C = 1.5 A _{dc} , I _{B1} = I _{B2} = 150 mA _{dc}	t _f		100	ns
Turn-On Time V _{CC} = 30, I _C = 1.5 A _{dc} , I _B = 150 mA _{dc}	t _{on}		100	ns
Turn-Off Time V _{CC} = 30, I _C = 1.5 A _{dc} , I _B = 150 mA _{dc}	t _{off}		600	ns

SAFE OPERATING AREA

DC Tests T _C = 25°C, 1 Cycle, t = 1.0 s				
Test 1 V _{CE} = 3.33 V _{dc} , I _C = 3.0 A _{dc}				
Test 2 V _{CE} = 40 V _{dc} , I _C = 160 mA _{dc} 2N3867, S V _{CE} = 60 V _{dc} , I _C = 80 mA _{dc} 2N3868, S				

(3) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤ 2.0%.