

# GSTMMDT3906J4F

## PNP General Purpose Transistor

### Product Description

This device is designed as a general-purpose amplifier and switch.

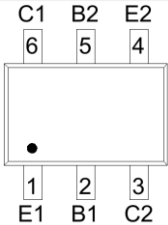
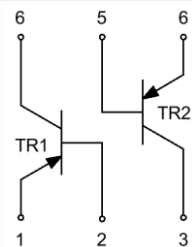
### Features

- Complementary to GSTMMDT3904
- Collector-emitter voltage  $V_{CE} = -40V$
- Collector current  $I_C = -200mA$

### Mechanical Data

- SOT-363 package design
- Epoxy meets UL 94 V-0 Flammability Rating
- RoHS Compliant and Halogen Free

### Packages & Pin Assignments

SOT-363			Equivalent Circuit		
 <p>Top View</p>					
Pin	Symbol	Description	Pin	Symbol	Description
1	E1	Emitter 1	4	E2	Emitter 2
2	B1	Base 1	5	B2	Base 2
3	C2	Collector 2	6	C1	Collector 1

## Ordering and Marking Information

Ordering Information			
Part Number	Package	Marking Code	Quantity/Reel
GSTMMDT3906J4F	SOT-363	K3N	3,000 PCS
<b>GSTMMDT3906</b> <sup>1</sup> <sup>2</sup> - <b>Product Code:</b> GSTMMDT3906 - <b>Package Code:</b> <sup>1</sup> is <b>J4</b> for SOT-363 - <b>Green Level:</b> <b>F</b> for RoHS Compliant and Halogen Free			
Marking Information			
<b>K3N</b> - <b>Product Code:</b> K3N			

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	-40	V
V <sub>CBO</sub>	Collector-Base Voltage	-40	V
V <sub>EBO</sub>	Emitter-Base Voltage	-5	V
I <sub>c</sub>	Collector Current	-200	mA
P <sub>D</sub>	Power Dissipation T <sub>A</sub> =25°C*	200	mW
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	625	°C/W
T <sub>J</sub>	Junction Temperature Range	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C

\* Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

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

Symbol	Description	Conditions	Min	Max	Unit
V <sub>(BR)CBO</sub>	Collector-base breakdown voltage	I <sub>C</sub> =-10μA, I <sub>E</sub> =0	-40	-	V
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> =-1mA, I <sub>B</sub> =0	-40	-	V
V <sub>(BR)EBO</sub>	Emitter-base breakdown voltage	I <sub>E</sub> =-10μA, I <sub>C</sub> =0	-5	-	V
I <sub>CEX</sub>	Collector cut-off current	V <sub>CE</sub> =-30V, V <sub>EB(OFF)</sub> =-3V	-	-50	nA
I <sub>CBO</sub>	Collector cut-off current	V <sub>CB</sub> =-30V, I <sub>E</sub> =0	-	-50	nA
I <sub>EBO</sub>	Emitter-Base Cutoff Current	V <sub>EB</sub> =-5V, I <sub>E</sub> =0	-	-50	nA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> =-1V, I <sub>C</sub> =-0.1mA	40	-	
		V <sub>CE</sub> =-1V, I <sub>C</sub> =-1mA	70	-	
		V <sub>CE</sub> =-1V, I <sub>C</sub> =-10mA	100	300	
		V <sub>CE</sub> =-1V, I <sub>C</sub> =-50mA	60	-	
		V <sub>CE</sub> =-1V, I <sub>C</sub> =-100mA	30	-	
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA	-	-0.25	V
		I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA	-	-0.4	
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA	-0.65	-0.85	V
		I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA	-	-0.95	
f <sub>T</sub>	Current Gain-Bandwidth Product	V <sub>CE</sub> =-20V, I <sub>C</sub> =-10mA f= 100MHz	250	-	MHz
C <sub>ob</sub>	Collector output capacitance	V <sub>CB</sub> =-5V, I <sub>E</sub> =0, f=1MHz	-	4.5	pF
N <sub>F</sub>	Noise figure	V <sub>CE</sub> =-5V, I <sub>C</sub> =-0.1mA, f=1KHz, R <sub>g</sub> =1KΩ	-	4	dB
t <sub>d</sub>	Delay time	V <sub>CC</sub> =-3V, V <sub>BE</sub> =0.5V, I <sub>C</sub> =-10mA, I <sub>B1</sub> =-I <sub>B2</sub> =-1mA	-	35	nS
t <sub>r</sub>	Rise time		-	35	nS
t <sub>s</sub>	Storage time	V <sub>CC</sub> =-3V, I <sub>C</sub> =-10mA, I <sub>B1</sub> =-I <sub>B2</sub> =-1mA	-	225	nS
t <sub>f</sub>	Fall time		-	75	nS

**Typical Performance Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

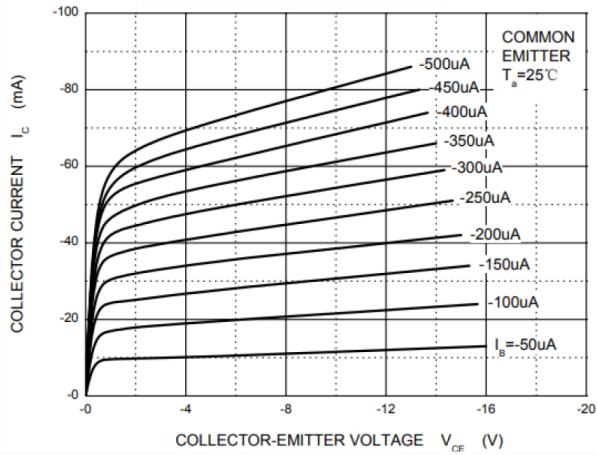


Figure 1. Static Characteristic

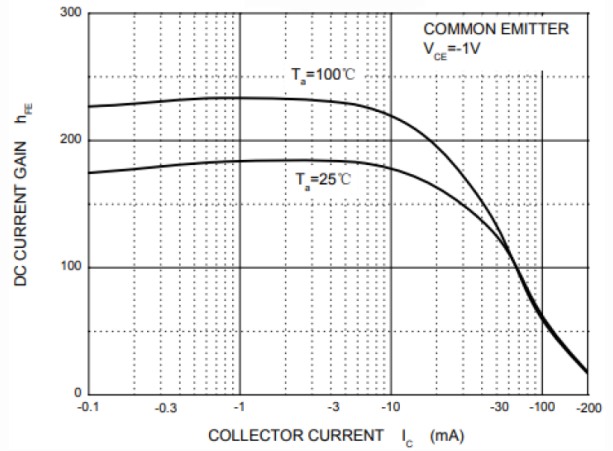


Figure 2. DC Current Gain vs. Collector Current

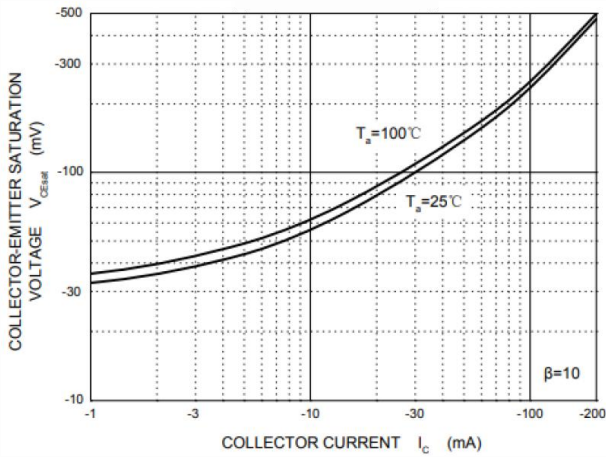


Figure 3. Collector-Emitter Saturation Voltage vs. Collector Current

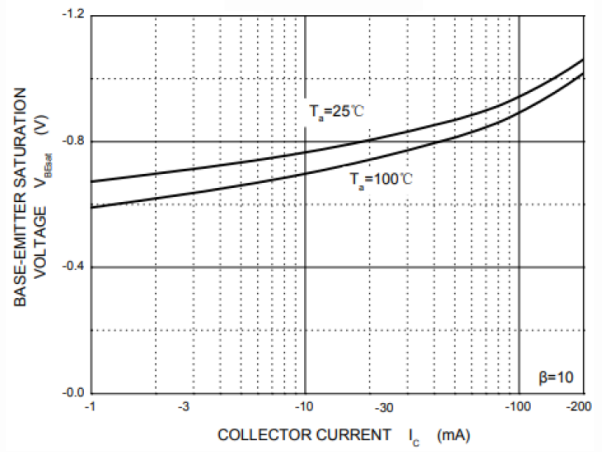


Figure 4. Base-Emitter Saturation Voltage vs. Collector Current

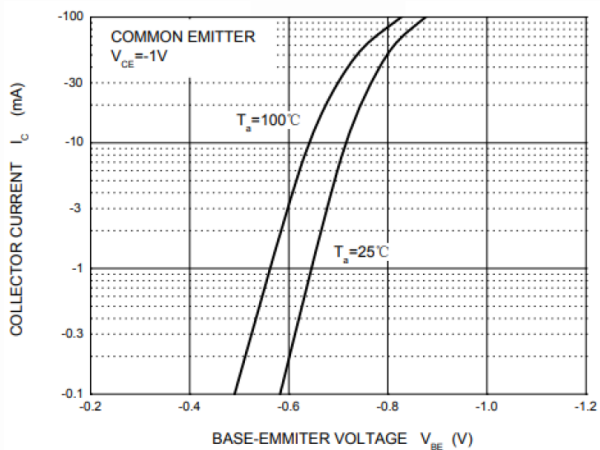


Figure 5. Collector Current vs. Base-Emitter Voltage

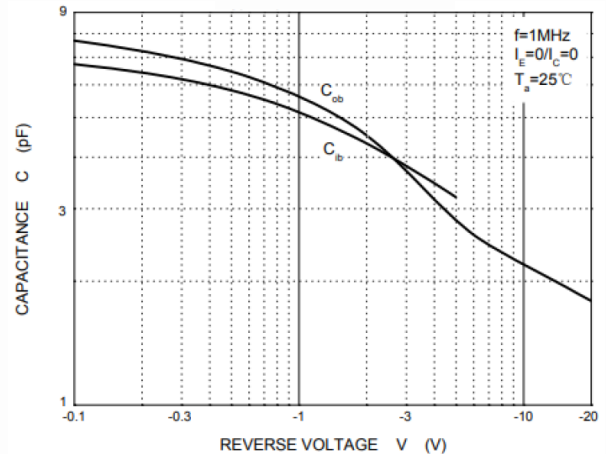


Figure 6. Capacitance vs. Reverse Voltage

## Typical Performance Characteristics

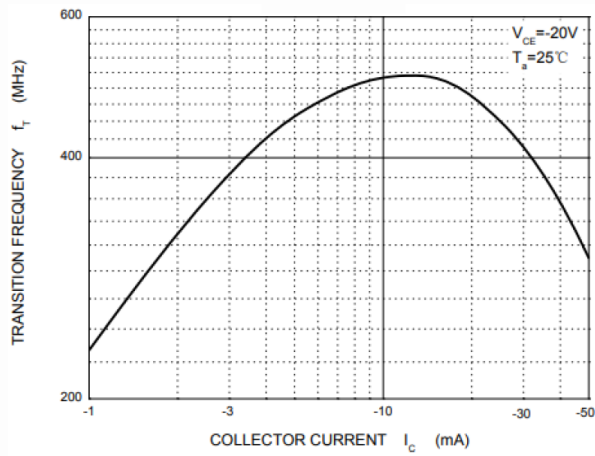


Figure 7. Transition Frequency vs. Collector Current

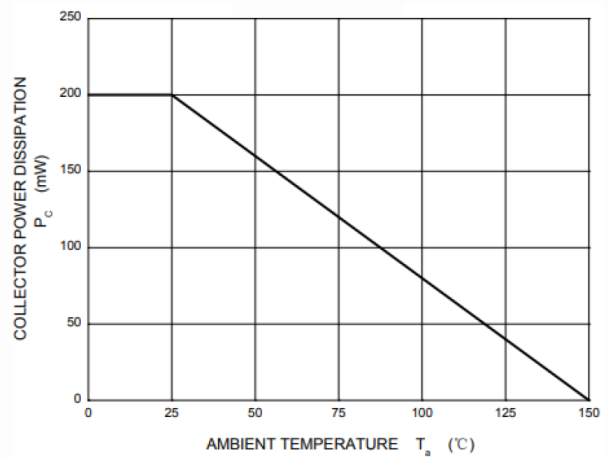
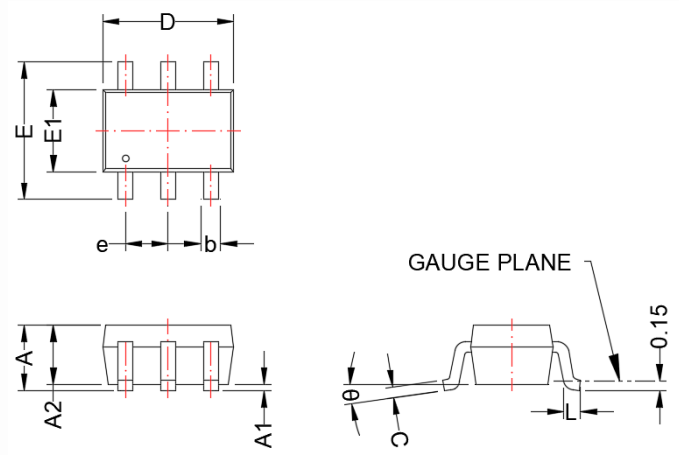


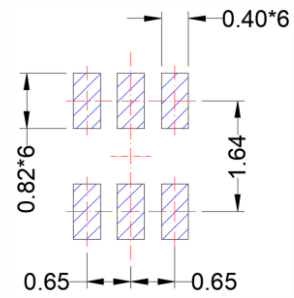
Figure 8. Collector Power Dissipation vs. Ambient Temperature

# SOT-363

## Package Dimension



## Recommended Land Pattern



Unit:mm

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.10	0.031	0.043
A1	0.00	0.10	0.000	0.004
A2	0.70	1.00	0.028	0.039
b	0.15	0.30	0.006	0.012
c	0.08	0.25	0.003	0.010
D	1.80	2.20	0.071	0.087
E	1.80	2.40	0.071	0.094
E1	1.15	1.35	0.045	0.053
e	0.65 BSC		0.026 BSC	
L	0.26	0.46	0.010	0.018
θ	0°	8°	0°	8°





**NOTE:**



Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

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## CONTACT US

GS Headquarter	
	4F, NO.43-1, Lane 11, Sec. 6, Minquan E. Rd Neihu District, Taipei City 114761, Taiwan (R.O.C).
	886-2-2657-9980
	886-2-2657-3630
	<a href="mailto:sales_twn@gs-power.com">sales_twn@gs-power.com</a>

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587