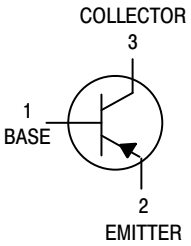
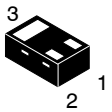
General Purpose Transistor
PNP Silicon
NST3906MX2



Features

- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant



X2DFN3 (1.0 x 0.6 mm)
CASE 714AC

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	−40	Vdc
Collector − Base Voltage	V_{CBO}	−40	Vdc
Emitter − Base Voltage	V_{EBO}	−5.0	Vdc
Collector Current − Continuous (Note 1)	I_C	−200	mAdc
Collector Current − Peak (Note 1)	I_{CM}	−800	mAdc

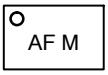
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Power Dissipation (Note 2) @ T_A = 25°C Derate above 25°C	P_D	 165 1.39	 mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	720	°C/W
Total Power Dissipation (Note 3) @ T_A = 25°C Derate above 25°C	P_D	 590 4.93	 mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 3)	$R_{\theta JA}$	203	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. Reference SOA Curve
2. Surface−mounted on FR4 board using a 0.6 mm^2, 2 oz. Cu pad
3. Surface−mounted on FR4 board using a 100 mm^2, 2 oz. Cu pad

MARKING DIAGRAM



AF = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NST3906MX2T5G	X2DFN3 (Pb−Free)	8000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (I_C = −1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	−40	–	Vdc
Collector – Base Breakdown Voltage (I_C = −10 μAdc, I_E = 0)	$V_{(BR)CBO}$	−40	–	Vdc
Emitter – Base Breakdown Voltage (I_E = −10 μAdc, I_C = 0)	$V_{(BR)EBO}$	−5.0	–	Vdc
Base Cutoff Current (V_{CE} = −30 Vdc, V_{EB} = −3.0 Vdc)	I_{BL}	–	−50	nAdc
Collector Cutoff Current (V_{CE} = −30 Vdc, V_{EB} = −3.0 Vdc)	I_{CEX}	–	−50	nAdc
ON CHARACTERISTICS (Note 4)				
DC Current Gain (I_C = −0.1 mAdc, V_{CE} = −1.0 Vdc) (I_C = −1.0 mAdc, V_{CE} = −1.0 Vdc) (I_C = −10 mAdc, V_{CE} = −1.0 Vdc) (I_C = −50 mAdc, V_{CE} = −1.0 Vdc) (I_C = −100 mAdc, V_{CE} = −1.0 Vdc)	H_{FE}	 60 80 100 60 30	 – – 300 – –	–
Collector – Emitter Saturation Voltage (I_C = −10 mAdc, I_B = −1.0 mAdc) (I_C = −50 mAdc, I_B = −5.0 mAdc)	$V_{CE(sat)}$	 – –	 −0.25 −0.4	Vdc
Base – Emitter Saturation Voltage (I_C = −10 mAdc, I_B = −1.0 mAdc) (I_C = −50 mAdc, I_B = −5.0 mAdc)	$V_{BE(sat)}$	 −0.65 –	 −0.85 −0.95	Vdc
SMALL– SIGNAL CHARACTERISTICS				
Current – Gain – Bandwidth Product (I_C = −10 mAdc, V_{CE} = −20 Vdc, f = 100 MHz)	f_T	250	–	MHz
Output Capacitance (V_{CB} = −5.0 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	–	4.5	pF
Input Capacitance (V_{EB} = −0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	–	10	pF
Input Impedance (I_C = −1.0 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	h_{ie}	2.0	12	kΩ
Voltage Feedback Ratio (I_C = −1.0 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	h_{re}	0.1	10	X 10^{-4}
Small – Signal Current Gain (I_C = −1.0 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	h_{fe}	100	400	–
Output Admittance (I_C = −1.0 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	h_{oe}	3.0	60	μmhos
Noise Figure (I_C = −100 μAdc, V_{CE} = −5.0 Vdc, R_S = 1.0 kΩ, f = 1.0 kHz)	NF	–	4.0	dB
SWITCHING CHARACTERISTICS				
Delay Time	(V_{CC} = −3.0 Vdc, V_{BE} = 0.5 Vdc, I_C = −10 mAdc, I_{B1} = −1.0 mAdc) t_d	–	35	ns
Rise Time	t_r	–	35	
Storage Time	(V_{CC} = −3.0 Vdc, I_C = −10 mAdc, I_{B1} = I_{B2} = −1.0 mAdc) t_s	–	225	ns
Fall Time	t_f	–	75	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

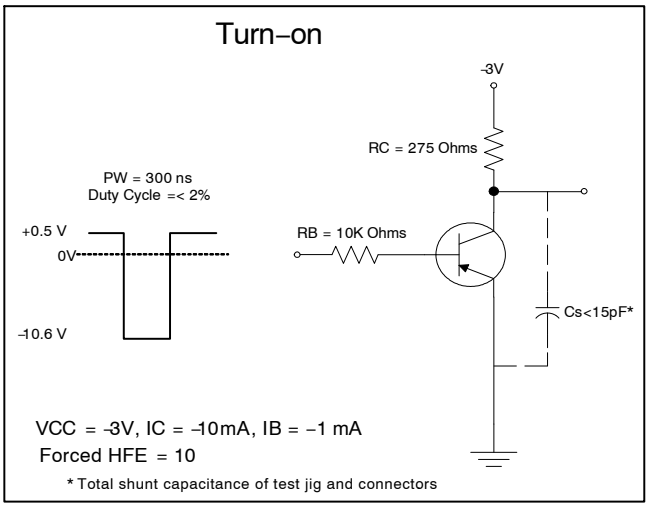


Figure 1. Delay and Rise Time Equivalent Test Circuit

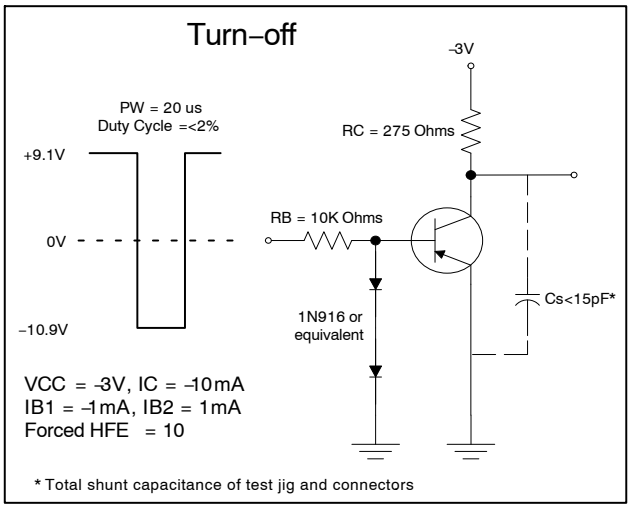


Figure 2. Storage and Fall Time Equivalent Test Circuit

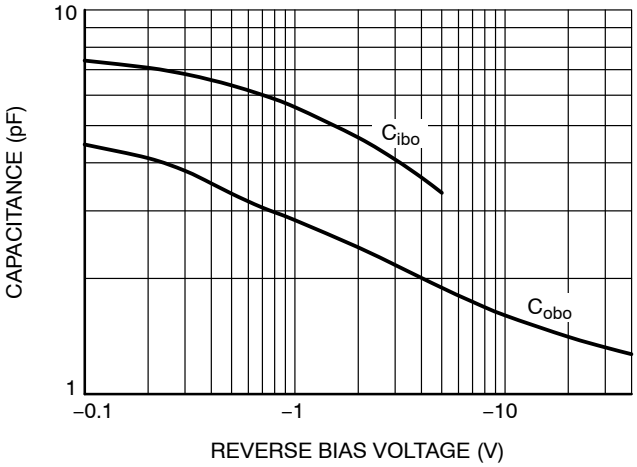


Figure 3. Capacitance

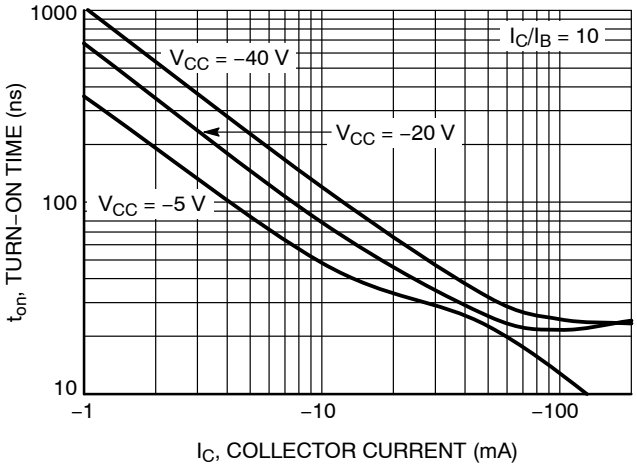


Figure 4. Turn−On Time

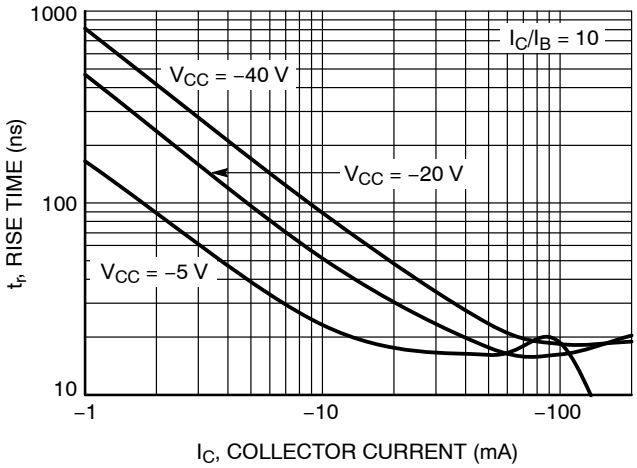


Figure 5. Rise Time

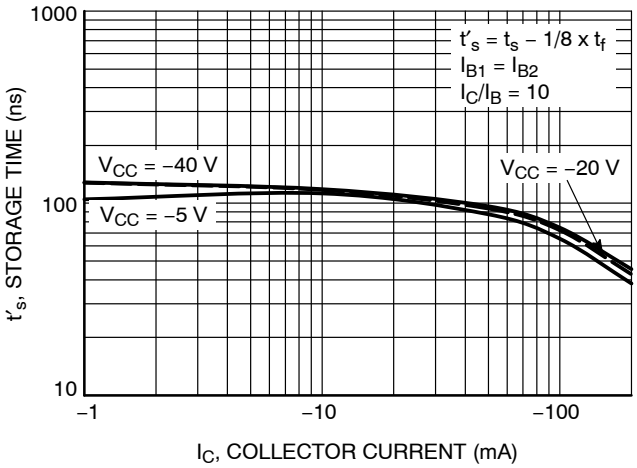


Figure 6. Storage Time

TYPICAL CHARACTERISTICS

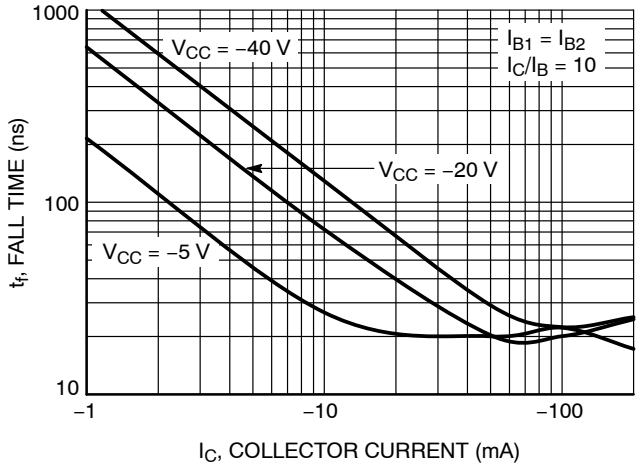


Figure 7. Fall Time

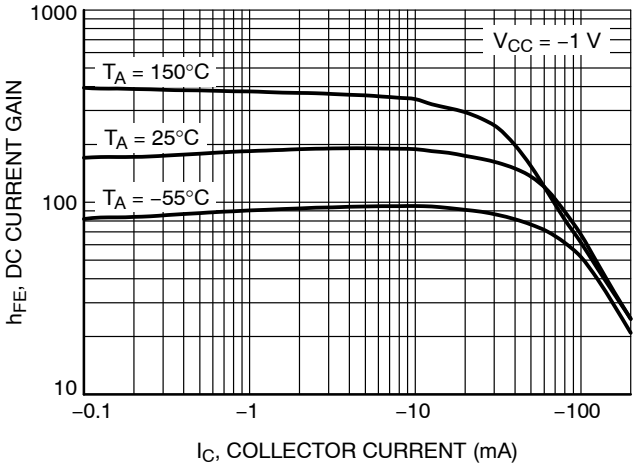


Figure 8. DC Current Gain

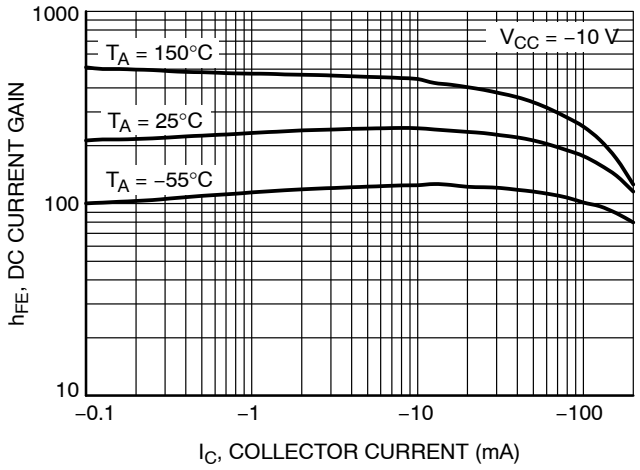


Figure 9. DC Current Gain

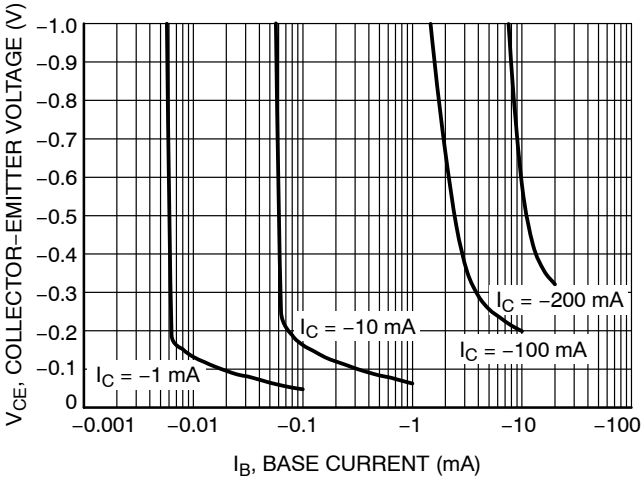


Figure 10. Collector Saturation Region

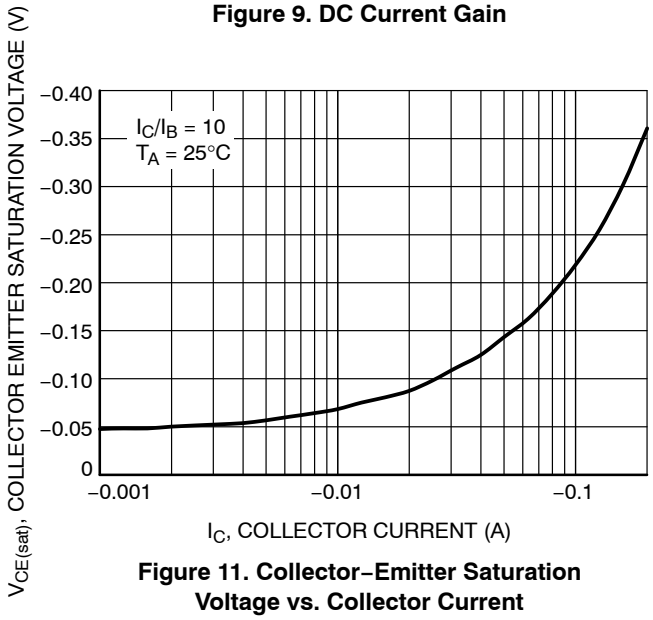


Figure 11. Collector−Emitter Saturation Voltage vs. Collector Current

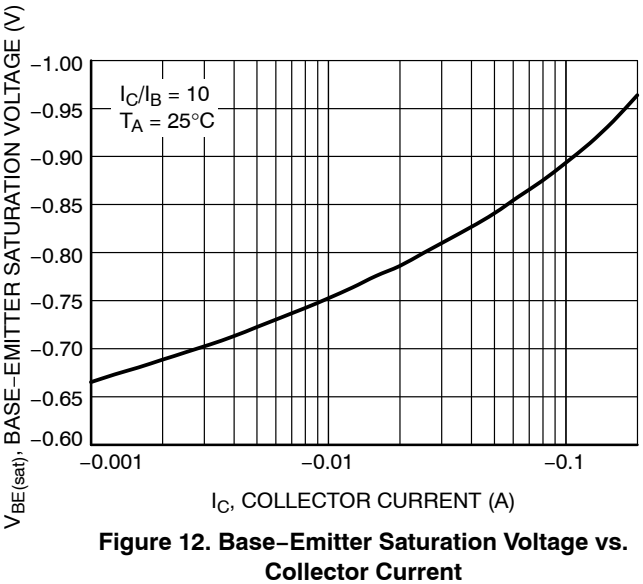


Figure 12. Base−Emitter Saturation Voltage vs. Collector Current

TYPICAL CHARACTERISTICS

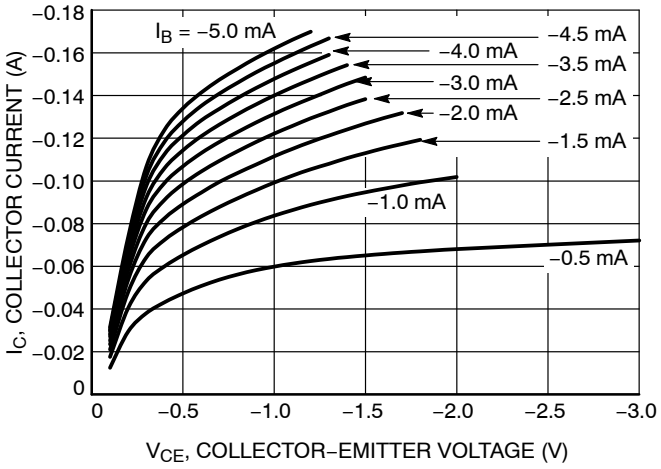


Figure 13. Collector Current vs. Collector−Emitter Voltage

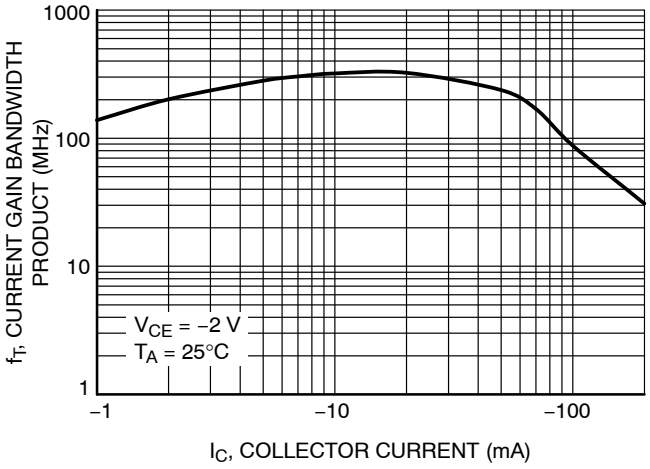


Figure 14. Current Gain Bandwidth vs. Collector Current

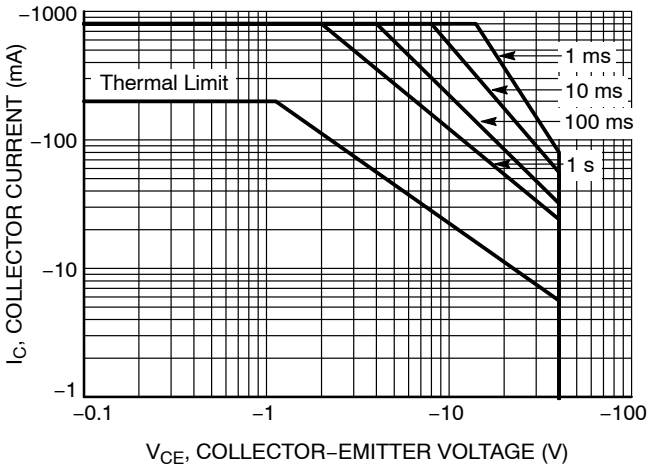
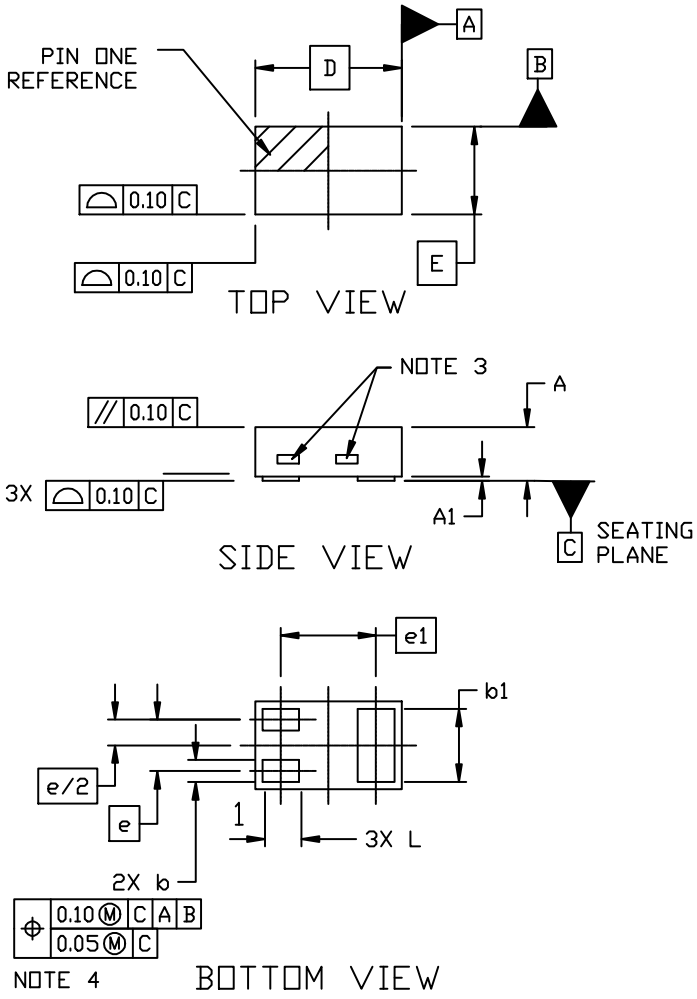


Figure 15. Safe Operating Area

NST3906MX2

PACKAGE DIMENSIONS

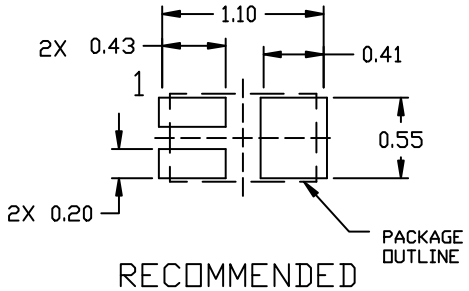
X2DFN3 1.0x0.6, 0.35P
CASE 714AC
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. EXPOSED COPPER ALLOWED AS SHOWN.
4. ALL PAD LOCATIONS CONTROLLED WITH THIS POSITIONAL TOLERANCE.

	MILLIMETERS		
DIM	MIN.	MAX.	MAX.
A	0.34	0.37	0.40
A1	0.00	---	0.05
b	0.10	0.15	0.20
b1	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.35 BSC		
e1	0.65 BSC		
L	0.20	0.25	0.30



RECOMMENDED MOUNTING FOOTPRINT

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT
North American Technical Support:
Voice Mail: 1 800-282-9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:
Phone: 00421 33 790 2910
For additional information, please contact your local Sales Representative

◊