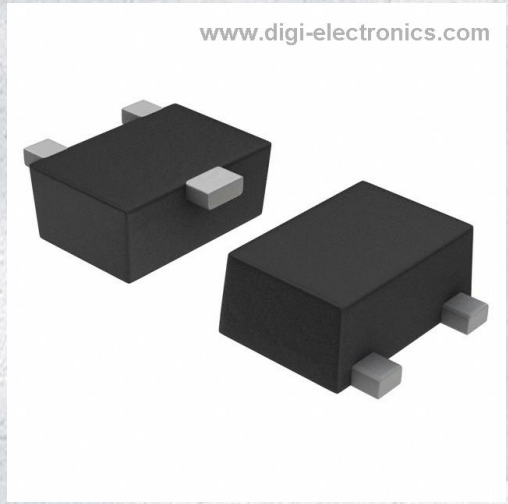
2SC5488A-TL-H Datasheet



DiGi Electronics Part Number	2SC5488A-TL-H-DG
Manufacturer	onsemi
Manufacturer Product Number	2SC5488A-TL-H
Description	RF TRANS NPN 10V 7GHZ 3SSFP
Detailed Description	RF Transistor NPN 10V 70mA 7GHz 100mW Surface Mount 3-SSFP

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
2SC5488A-TL-H	onsemi
Series:	Product Status:
-	Active
Transistor Type:	Voltage - Collector Emitter Breakdown (Max):
NPN	10V
Frequency - Transition:	Noise Figure (dB Typ @ f):
7GHz	1dB @ 1GHz
Gain:	Power - Max:
12dB	100mW
DC Current Gain (hFE) (Min) @ Ic, Vce:	Current - Collector (Ic) (Max):
90 @ 20mA, 5V	70mA
Operating Temperature:	Mounting Type:
150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
SC-81	3-SSFP
Base Product Number:	
2SC5488	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0075	

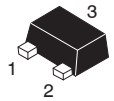
onsemi

DATA SHEET
www.onsemi.com

RF Transistor

10 V, 70 mA, f_T = 7 GHz, NPN Single SSFP

2SC5488A



SOT−623 / SSFP
CASE 631AC

Features

- Low−noise: NF = 1.0 dB Typ (f = 1 GHz)
- High Gain: $|S21e|^2$ = 12 dB Typ (f = 1 GHz)
- High Cut−off Frequency: f_T = 7 GHz Typ
- Ultrasmall, Slim Flat−lead Package (1.4 mm x 0.8 mm x 0.6 mm)
- This Device is Pb−Free and Halogen Free

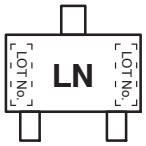
Specifications

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector−to−Base Voltage	20	V
V_{CEO}	Collector−to−Emitter Voltage	10	V
V_{EBO}	Emitter−to−Base Voltage	2	V
I_C	Collector Current	70	mA
P_C	Collector Dissipation	100	mW
Tj	Junction Temperature	150	°C
Tstg	Storage Temperature	−55 to +150	°C

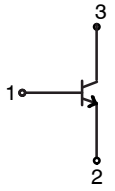
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MARKING DIAGRAM



LN = Specific Device Code

ELECTRICAL CONNECTION



1: Base
2: Emitter
3: Collector

ORDERING INFORMATION

Device	Package	Shipping†
2SC5488A−TL−H	SOT−623 / SSFP (Pb−Free, Halide 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 Specification Brochure, BRD8011/D.

© Semiconductor Components Industries, LLC, 2013

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10 V, I_E = 0 A	–	–	1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 A	–	–	10	μA
DC Current Gain	hFE	V_{CE} = 5 V, I_C = 20 mA	90	–	200	
Gain−Bandwidth Product	f_T	V_{CE} = 5 V, I_C = 20 mA	5	7	–	GHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1 MHz	–	0.7	1.2	pF
Reverse Transfer Capacitance	Cre		–	0.45	–	pF
Forward Transfer Gain	$\|S21e\|^2_1$	V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	9	12	–	dB
	$\|S21e\|^2_2$	V_{CE} = 2 V, I_C = 3 mA, f = 1 GHz	–	8.5	–	dB
Noise Figure	NF	V_{CE} = 5 V, I_C = 7 mA, f = 1 GHz	–	1.0	1.8	dB

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.

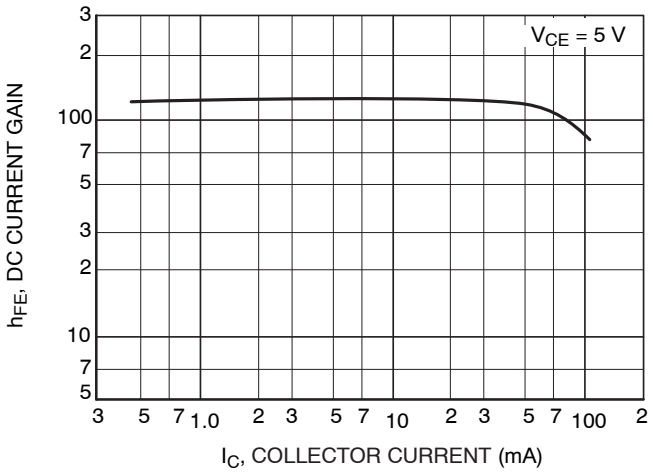


Figure 1. h_{FE} – I_C

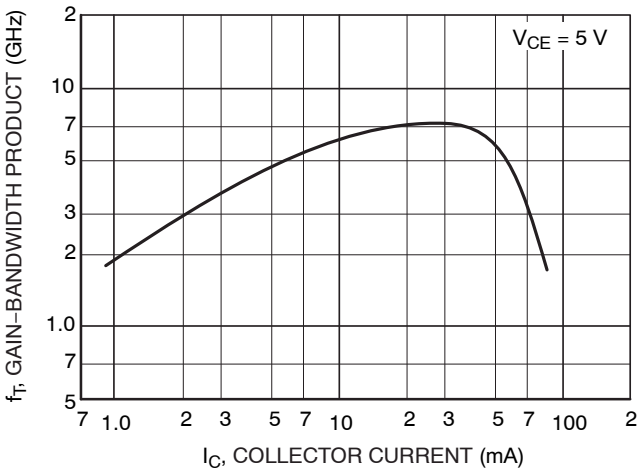


Figure 2. f_T – I_C

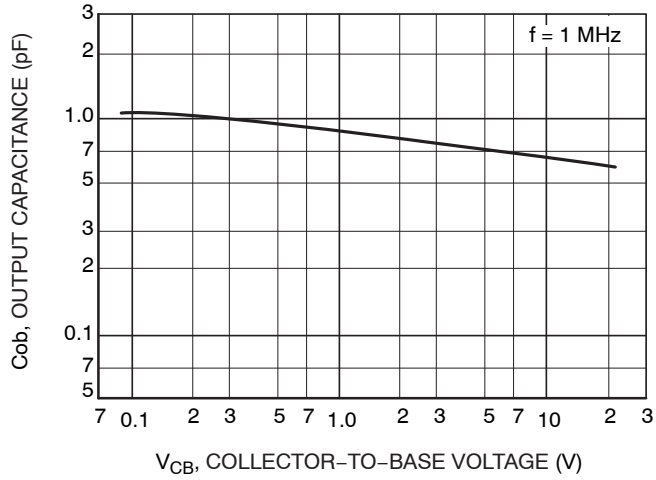


Figure 3. Cob – V_{CB}

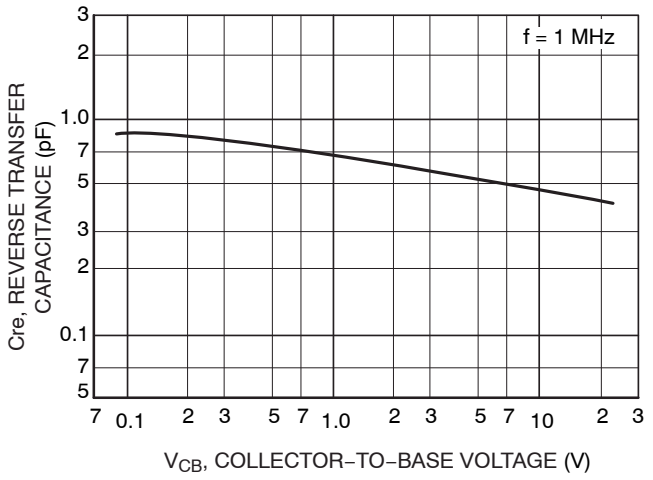


Figure 4. Cre – V_{CB}

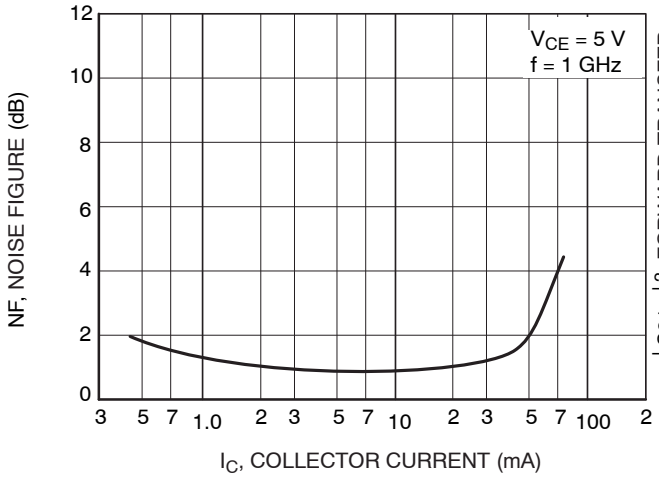


Figure 5. NF – I_C

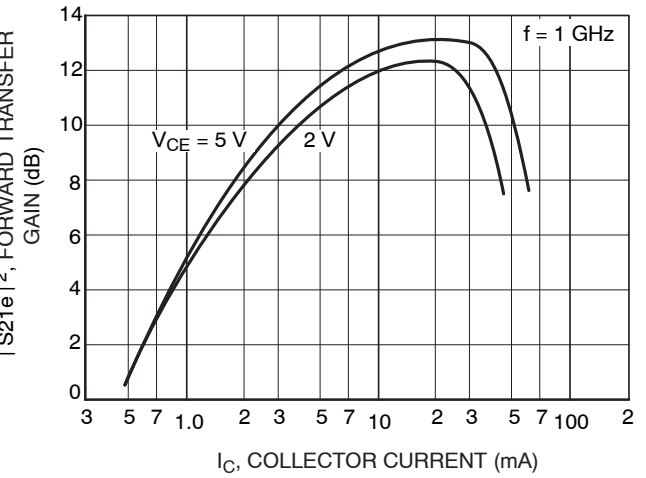


Figure 6. $|S21e|^2$ – I_C

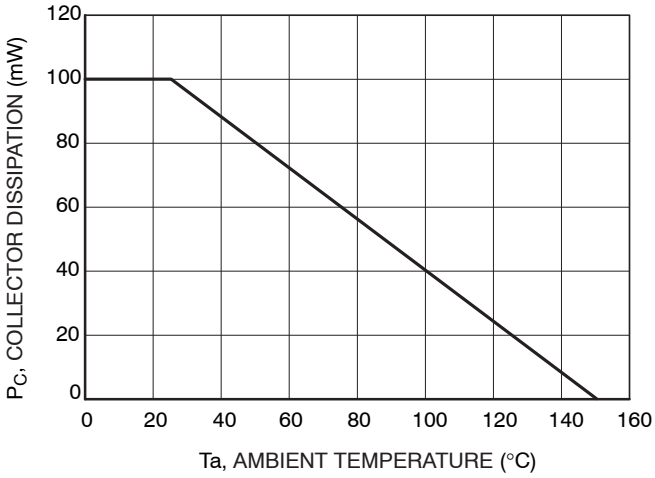


Figure 7. P_C – Ta

S Parameters (Common Emitter)

V_{CE} = 5 V, I_C = 7 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.786	–40.7	17.507	151.3	0.028	70.1	0.898	–20.4
200	0.677	–72.4	13.998	131.4	0.046	58.0	0.739	–33.4
400	0.546	–112.7	9.061	108.6	0.064	49.6	0.525	–43.7
600	0.492	–135.2	6.442	96.1	0.076	49.3	0.423	–46.7
800	0.473	–150.0	5.005	87.3	0.087	50.8	0.374	–44.4
1000	0.465	–160.0	4.073	80.4	0.099	52.6	0.346	–49.7
1200	0.457	–169.5	3.449	74.0	0.111	54.0	0.332	–51.6
1400	0.451	–176.2	2.989	68.6	0.124	55.2	0.321	–54.1
1600	0.449	177.8	2.658	63.8	0.138	56.6	0.319	–56.2
1800	0.454	172.5	2.378	58.4	0.151	56.7	0.313	–60.0
2000	0.460	167.1	2.154	54.0	0.166	56.7	0.311	–63.2

V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.601	–65.8	28.967	137.1	0.023	64.1	0.757	–32.9
200	0.497	–103.7	19.309	116.6	0.035	57.0	0.534	–50.3
400	0.435	–139.6	10.891	98.6	0.050	58.7	0.345	–50.3
600	0.419	–156.6	7.461	89.3	0.065	61.3	0.280	–50.7
800	0.414	–166.6	5.695	82.5	0.081	63.1	0.251	–51.3
1000	0.413	–174.0	4.613	77.0	0.098	63.8	0.235	–52.9
1200	0.413	178.6	3.870	71.8	0.114	63.9	0.226	–55.1
1400	0.411	173.8	3.345	66.9	0.131	63.6	0.221	–57.7
1600	0.413	169.6	2.960	62.7	0.148	63.2	0.220	–60.2
1800	0.416	165.1	2.655	58.0	0.165	61.8	0.219	–64.8
2000	0.422	160.3	2.406	54.0	0.182	60.6	0.218	–68.3

V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.888	–30.2	9.280	158.6	0.038	73.6	0.949	–15.1
200	0.815	–56.4	8.218	141.3	0.067	60.5	0.849	–26.9
400	0.690	–96.0	6.074	116.7	0.098	45.1	0.657	–41.1
600	0.616	–120.7	4.517	101.4	0.112	38.4	0.539	–47.6
800	0.584	–138.0	3.610	90.4	0.120	35.8	0.475	–51.2
1000	0.566	–150.7	2.995	81.9	0.125	35.7	0.434	–54.5
1200	0.555	–161.2	2.540	74.2	0.131	36.5	0.410	–57.5
1400	0.546	–169.3	2.213	67.5	0.137	38.4	0.393	–60.7
1600	0.541	–176.4	1.982	62.0	0.143	40.7	0.391	–64.0
1800	0.545	177.1	1.774	55.9	0.152	42.5	0.382	–67.8
2000	0.547	170.9	1.614	50.9	0.163	44.7	0.381	–72.1

Land Pattern Example

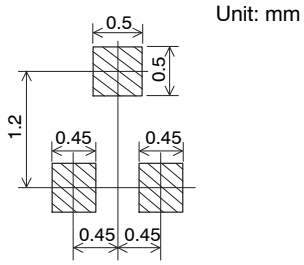
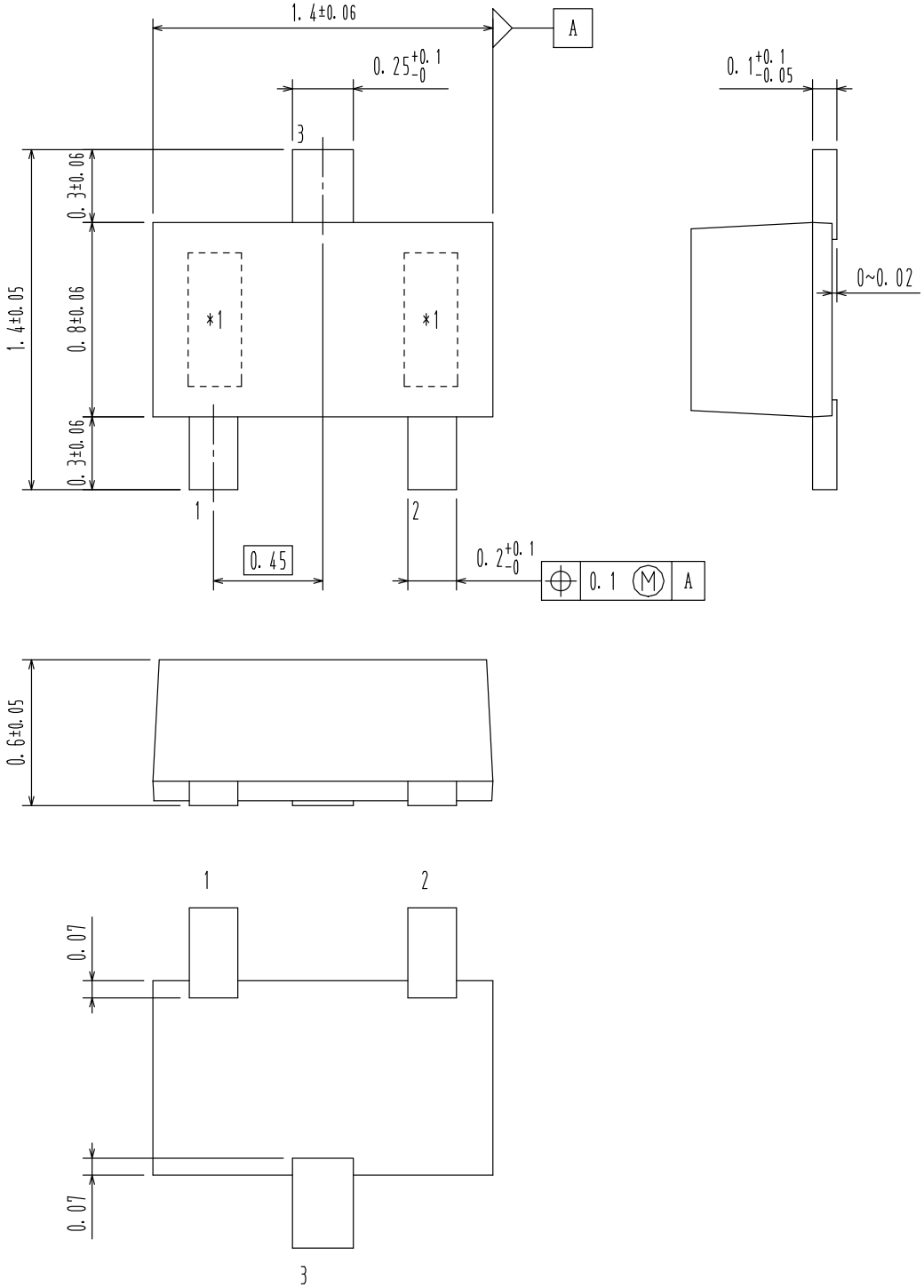


Figure 8. Land Pattern Example

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SOT−623 / SSFP
CASE 631AC
ISSUE O

DATE 29 FEB 2012



DOCUMENT NUMBER:	**98AON67431E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	**SOT−623 / SSFP**		**PAGE 1 OF 1**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

onsemi, ONSEMI , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

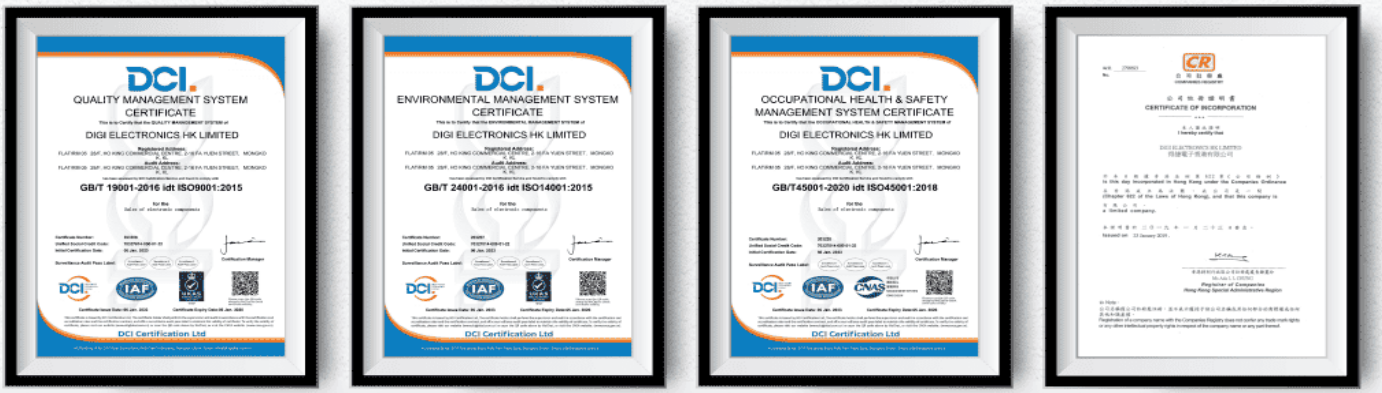
ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.