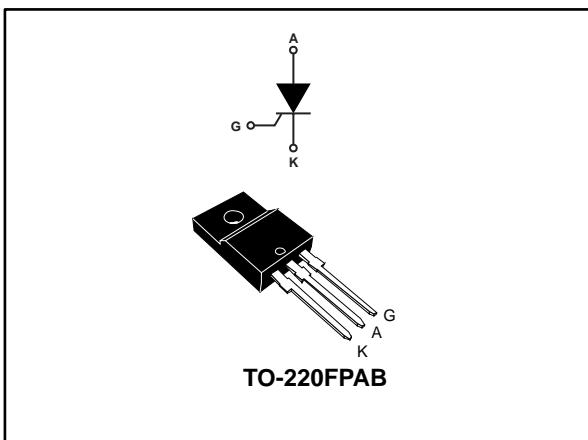


High temperature 20 A SCRs

Datasheet - production data



Features

- High junction temperature: $T_j = 150^\circ\text{C}$
- High noise immunity $dV/dt = 400 \text{ V}/\mu\text{s}$ up to 150°C
- Gate triggering current $I_{GT} = 10 \text{ mA}$
- Peak off-state voltage $V_{DRM}/V_{RRM} = 600 \text{ V}$
- High turn-on current rise $dI/dt = 100 \text{ A}/\mu\text{s}$
- ECOPACK®2 compliant component
- TO-220FPAB insulated package:
 - Complies with UL standards (File ref: E81734)
 - Insulated voltage: $2000 \text{ V}_{\text{RMS}}$

Applications

- Motorbike voltage regulator circuits
- Inrush current limiting circuits
- Motor control circuits and starters
- Light dimmers
- Solid state relays

Description

Packaged in an insulated TO-220FPAB, this device offers high thermal performance during operation of up to $20 \text{ A}_{\text{RMS}}$, thanks to a junction temperature of up to 150°C .

This insulated fullpack package allows a back to back configuration.

The combination of noise immunity and low gate triggering current allows to design strong and compact control circuits.

Table 1: Device summary

Order code	Package	V_{DRM}/V_{RRM}	I_{GT}
TN2010H-6FP	TO-220FPAB	600 V	10 mA

1 Characteristics

Table 2: Absolute maximum ratings (limiting values), $T_j = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter		Value	Unit	
$I_{T(\text{RMS})}$	RMS on-state current (180 ° conduction angle)	$T_c = 80^\circ\text{C}$	20	A	
$I_{T(\text{AV})}$	Average on-state current (180 ° conduction angle)	$T_c = 80^\circ\text{C}$	12.7	A	
		$T_c = 99^\circ\text{C}$	10		
		$T_c = 112^\circ\text{C}$	8		
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25 °C)	$t_p = 8.3 \text{ ms}$	197	A	
		$t_p = 10 \text{ ms}$	180		
I^2t	I^2t value for fusing	$t_p = 10 \text{ ms}$	162	A^2s	
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100 \text{ ns}$	$f = 60 \text{ Hz}$	100	$\text{A}/\mu\text{s}$	
V_{DSM}/V_{RSM}	Non repetitive surge peak off-state voltage	$t_p = 10 \text{ ms}$	700	V	
I_{GM}	Peak gate current	$t_p = 20 \mu\text{s}$	$T_j = 150^\circ\text{C}$	4	A
$P_{G(\text{AV})}$	Average gate power dissipation		$T_j = 150^\circ\text{C}$	1	W
T_{stg}	Storage junction temperature range			-40 to +150	$^\circ\text{C}$
T_j	Operating junction temperature range			-40 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering during 10 s			260	$^\circ\text{C}$
$V_{INS(\text{RMS})}$	Insulation RMS voltage, 60 seconds			2000	V

Table 3: Electrical characteristics ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Test conditions		Value	Unit	
I_{GT}	$V_D = 12 \text{ V}$, $R_L = 33 \Omega$		Typ.	5	
			Max.	10	
			Max.	1.3	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3 \text{ k}\Omega$	$T_j = 150^\circ\text{C}$	Min.	0.1	V
I_H	$I_T = 500 \text{ mA}$, gate open		Max.	40	mA
I_L	$I_G = 1.2 \times I_{GT}$		Max.	60	mA
dV/dt	$V_D = 402 \text{ V}$, gate open	$T_j = 150^\circ\text{C}$	Min.	400	$\text{V}/\mu\text{s}$
t_{gt}	$I_{TM} = 40 \text{ A}$, $V_D = 402 \text{ V}$, $I_G = 20 \text{ mA}$, $(dI_G/dt) \text{ max} = 0.2 \text{ A}/\mu\text{s}$		Typ.	1.9	μs
t_q	$I_{TM} = 40 \text{ A}$, $V_D = 402 \text{ V}$, $(dI/dt)\text{off} = 30 \text{ A}/\mu\text{s}$, $V_R = 25 \text{ V}$, $dV_D/dt = 40 \text{ V}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	Typ.	70	μs

Table 4: Static characteristics

Symbol	Test conditions			Value	Unit
V_{TM}	$I_{TM} = 40 \text{ A}$, $t_p = 380 \mu\text{s}$	$T_j = 25^\circ\text{C}$	Max.	1.6	V
V_{TO}	Threshold voltage	$T_j = 150^\circ\text{C}$	Max.	0.82	
R_D	Dynamic resistance	$T_j = 150^\circ\text{C}$	Max.	17.5	$\text{m}\Omega$
I_{DRM}, I_{RRM}	$V_D = V_{DRM}$, $V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$	Max.	5	μA
		$T_j = 125^\circ\text{C}$		2	mA
		$T_j = 150^\circ\text{C}$		3.9	

Table 5: Thermal parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (DC)	Max.	4.0
$R_{th(j-a)}$	Junction to ambient (DC)	Typ.	$^{\circ}\text{C}/\text{W}$

1.1 Characteristics (curves)

Figure 1: Maximum power dissipation versus average on-state current

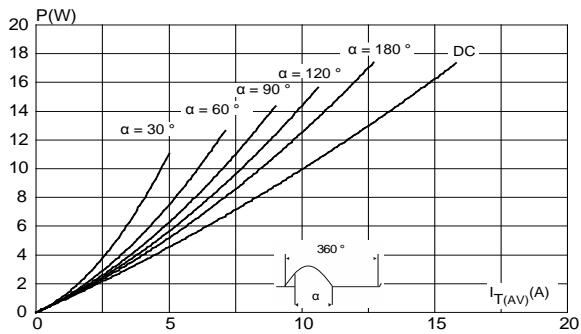


Figure 2: Average and DC on-state current versus case temperature

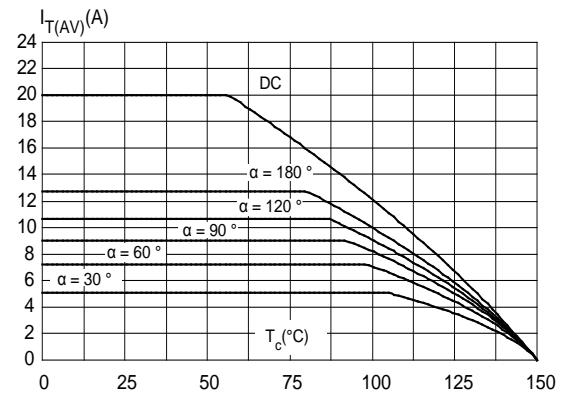


Figure 3: Average and D.C. on state current versus ambient temperature

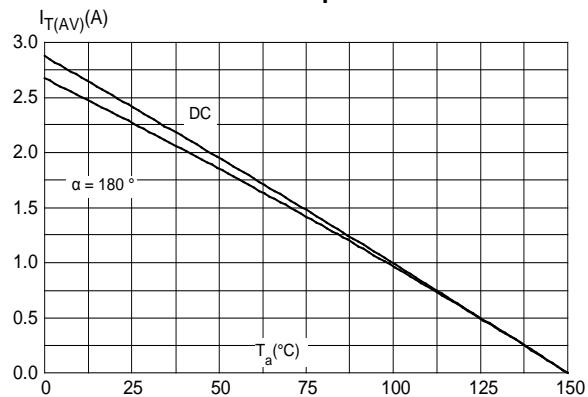


Figure 4: Relative variation of thermal impedance versus pulse duration

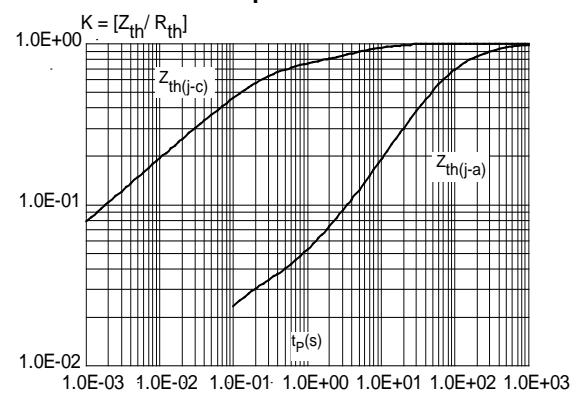


Figure 5: Relative variation of gate triggering current and gate voltage versus junction temperature (typical values)

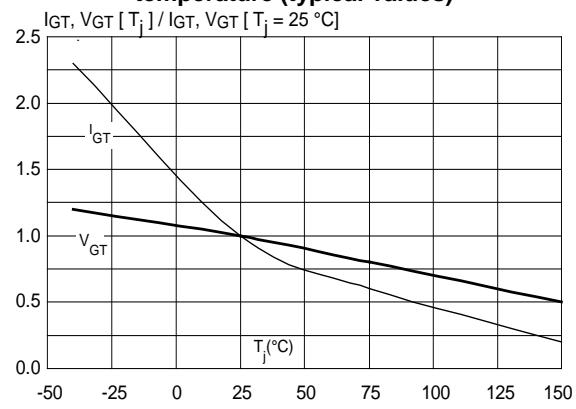


Figure 6: Relative variation of holding and latching current versus junction temperature (typical values)

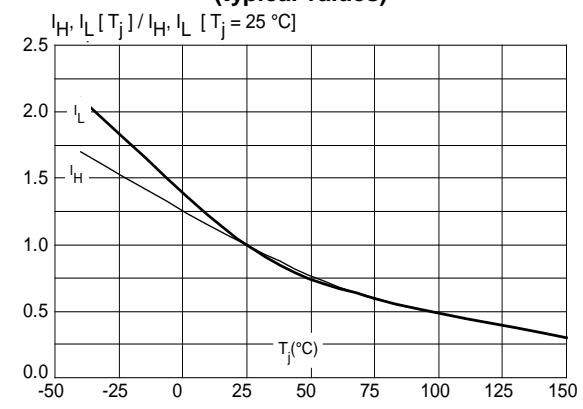


Figure 7: Relative variation of static dV/dt immunity versus junction temperature (typical values)

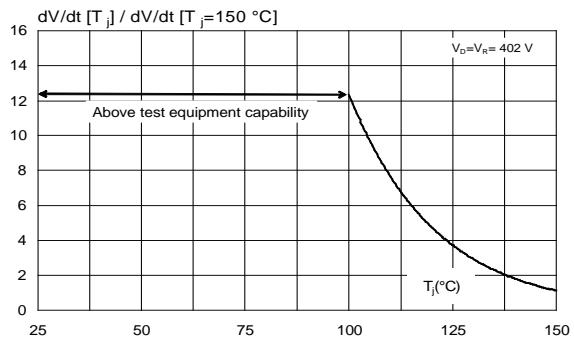


Figure 8: Surge peak on-state current versus number of cycles

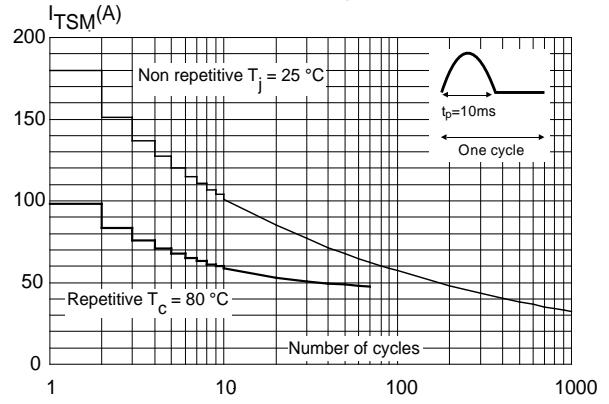


Figure 9: Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10 \text{ ms}$

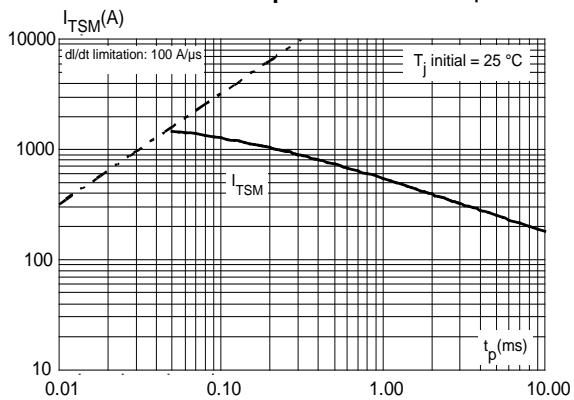


Figure 10: On-state characteristics (maximum values)

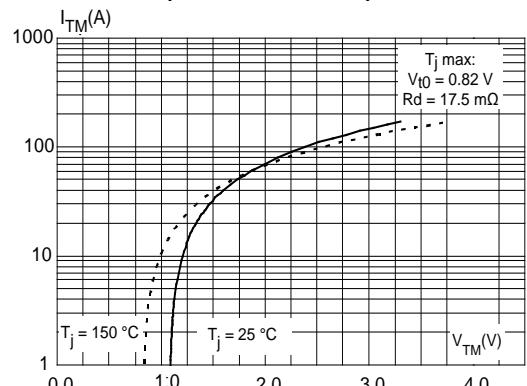
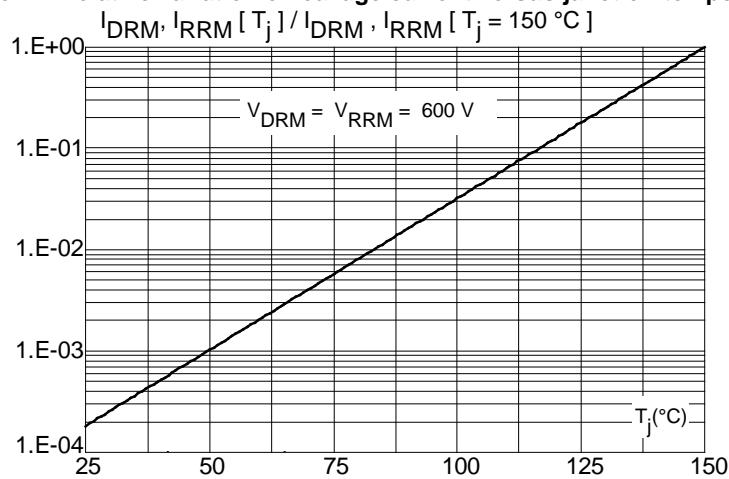


Figure 11: Relative variation of leakage current versus junction temperature



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com.
ECOPACK® is an ST trademark.

- Epoxy meets UL94, V0
- Lead-free, halogen-free package
- Recommended torque value (TO-220FPAB): 0.4 to 0.6 N.m

2.1 TO-220AB package information

Figure 12: TO-220FPAB package outline

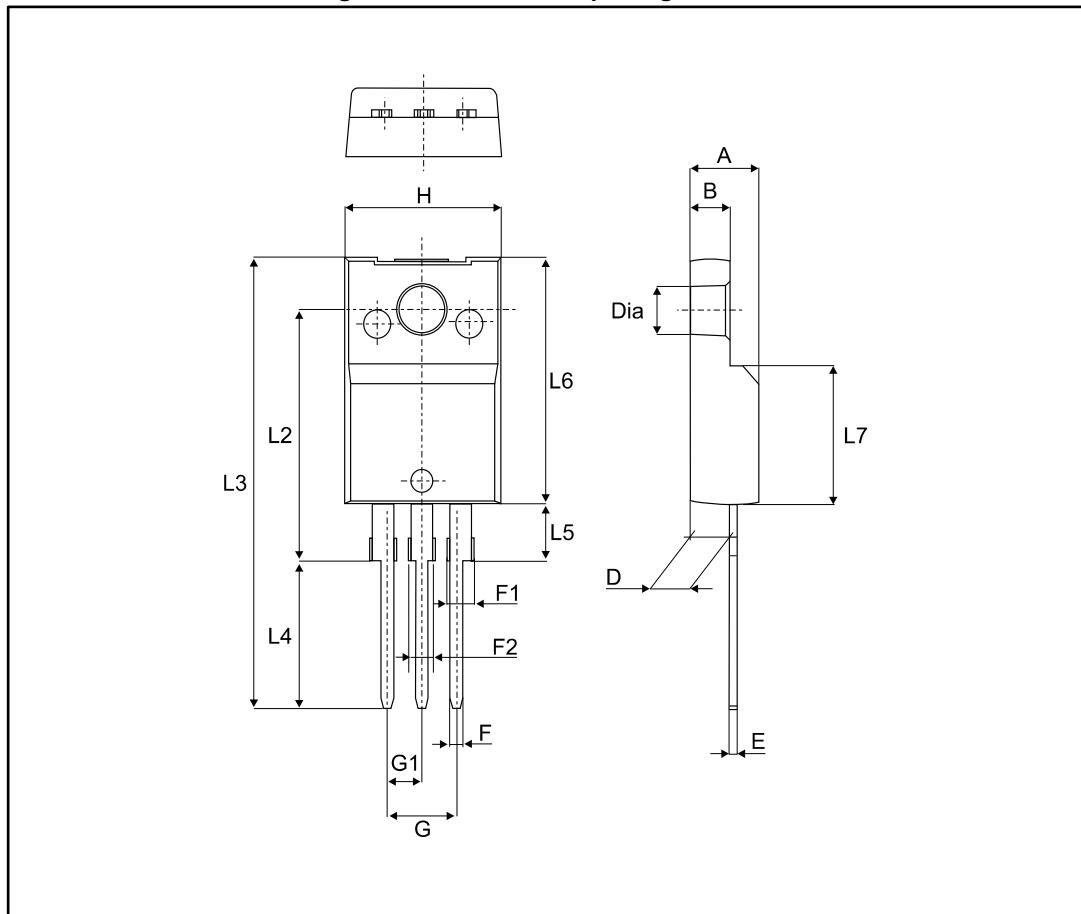


Table 6: TO-220FPAB package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.1739	0.1818
B	2.5	2.7	0.0988	0.1067
D	2.50	2.75	0.0988	0.1087
E	0.45	0.70	0.0178	0.0277
F	0.75	1.0	0.0296	0.0395
F1	1.15	1.70	0.0455	0.0672
F2	1.15	1.70	0.0455	0.0672
G	4.95	5.20	0.1957	0.2055
G1	2.40	2.70	0.0949	0.1067
H	10.00	10.40	0.3953	0.4111
L2	16.00 typ.		0.6324 typ.	
L3	28.60	30.60	1.1304	1.2095
L4	9.80	10.6	0.3874	0.4190
L5	2.90	3.60	0.1146	0.1423
L6	15.90	16.40	0.6285	0.6482
L7	9.00	9.30	0.3557	0.3676
Dia	3.0	3.20	0.1186	0.1265

3 Ordering information

Figure 13: Ordering information scheme

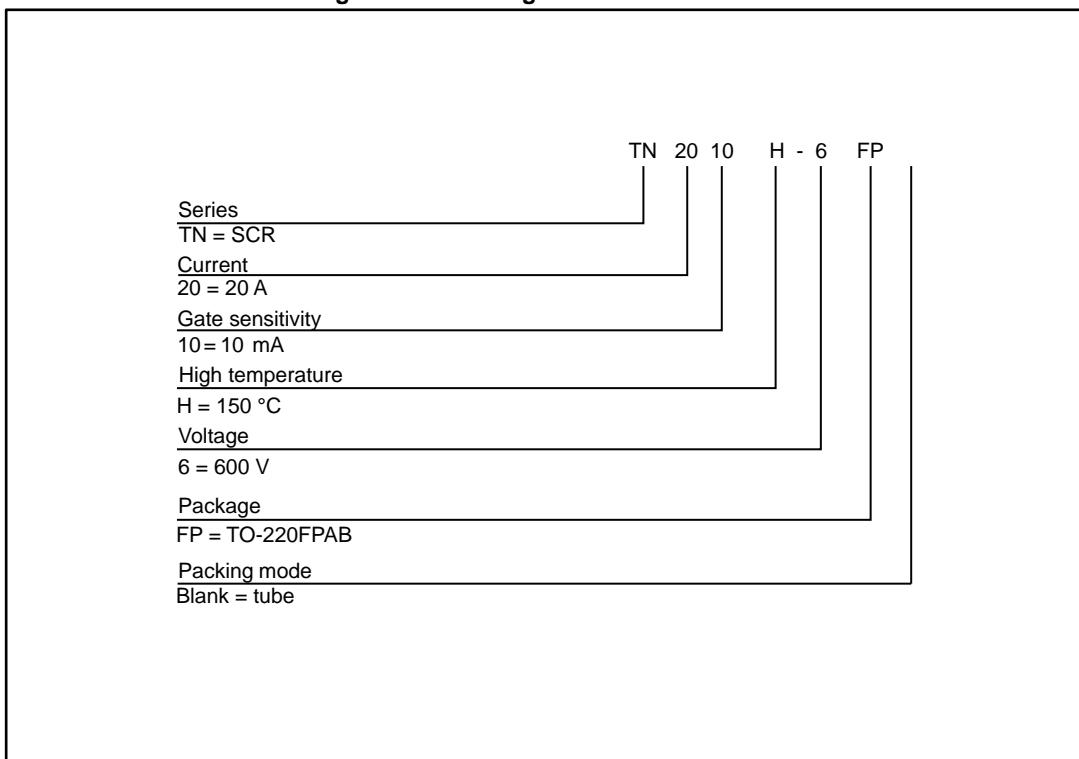


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
TN2010H-6FP	TN2010H6	TO-220FPAB	2.0 g	50	Tube

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
01-Aug-2017	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics – All rights reserved



OCEAN CHIPS

Океан Электроники

Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибутором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибутором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А