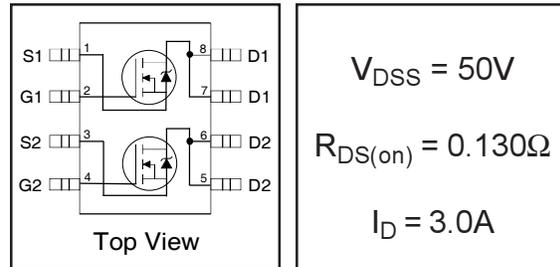


# IRF7103PbF

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dual N-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching
- Lead-Free



## Description

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and dual-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.



## Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	3.0	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	2.3	
$I_{DM}$	Pulsed Drain Current ①	10	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
dv/dt	Peak Diode Recovery dv/dt ②	4.5	V/nS
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	°C

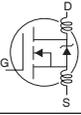
## Thermal Resistance Ratings

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④	—	—	62.5	°C/W

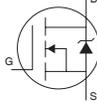
# IRF7103PbF

International  
**IR** Rectifier

## Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

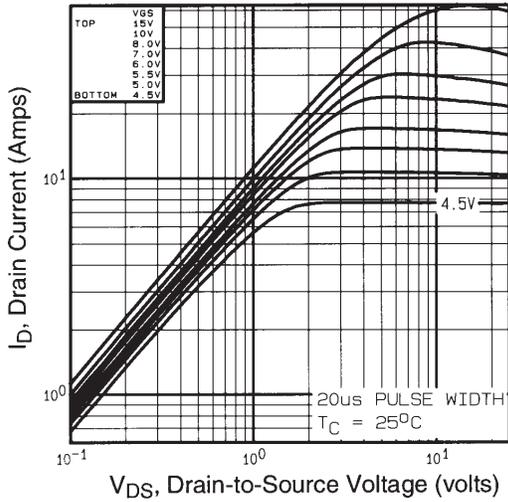
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	50	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.049	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1mA$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	—	0.11	0.13	$\Omega$	$V_{GS} = 10V, I_D = 3.0A$ ③
		—	0.16	0.20		$V_{GS} = 4.5V, I_D = 1.5A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	3.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$g_{fs}$	Forward Transconductance	—	3.8	—	S	$V_{DS} = 15V, I_D = 3.0A$ ③
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	2.0	$\mu A$	$V_{DS} = 40V, V_{GS} = 0V$
		—	—	25		$V_{DS} = 40V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$
$Q_g$	Total Gate Charge	—	12	30	nC	$I_D = 2.0A$
$Q_{gs}$	Gate-to-Source Charge	—	1.2	—		$V_{DS} = 25V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	3.5	—		$V_{GS} = 10V$ ③
$t_{d(on)}$	Turn-On Delay Time	—	9.0	20	ns	$V_{DD} = 25V$
$t_r$	Rise Time	—	8.0	20		$I_D = 1.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	45	70		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	25	50		$R_D = 25\Omega$ ③
$L_D$	Internal Drain Inductance	—	4.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact 
$L_S$	Internal Source Inductance	—	6.0	—		
$C_{iss}$	Input Capacitance	—	290	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	140	—		$V_{DS} = 25V$
$C_{riss}$	Reverse Transfer Capacitance	—	37	—		$f = 1.0MHz$

## Source-Drain Ratings and Characteristics

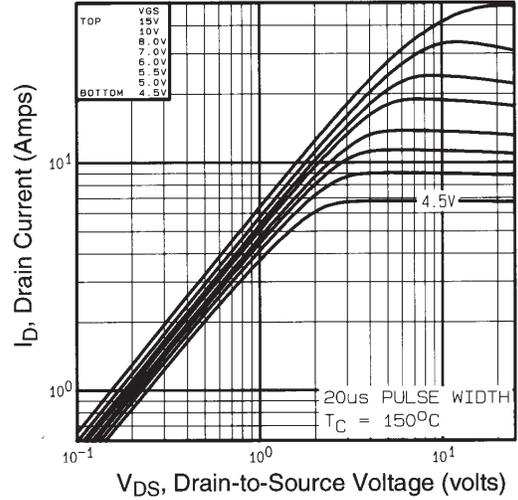
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	12		
$V_{SD}$	Diode Forward Voltage	—	—	1.2	V	$T_J = 25^\circ\text{C}, I_S = 1.5A, V_{GS} = 0V$ ③
$t_{rr}$	Reverse Recovery Time	—	70	100	ns	$T_J = 25^\circ\text{C}, I_F = 1.5A$
$Q_{rr}$	Reverse Recovery Charge	—	110	170	nC	$di/dt = 100A/\mu s$ ③
$t_{on}$	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$ )				

### Notes:

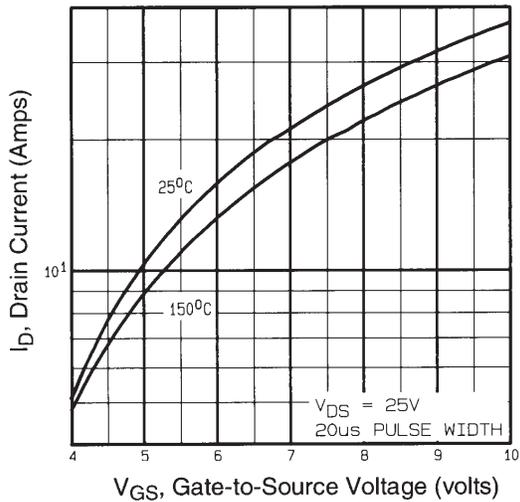
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ②  $I_{SD} \leq 1.8A, di/dt \leq 90A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .
- ④ Surface mounted on FR-4 board,  $t \leq 10sec$ .



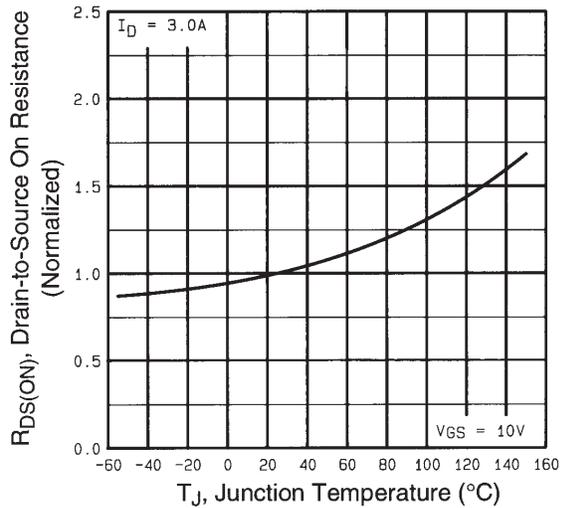
**Fig 1.** Typical Output Characteristics,



**Fig 2.** Typical Output Characteristics,



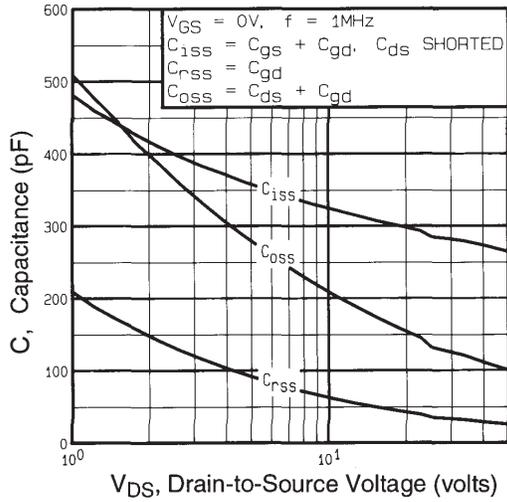
**Fig 3.** Typical Transfer Characteristics



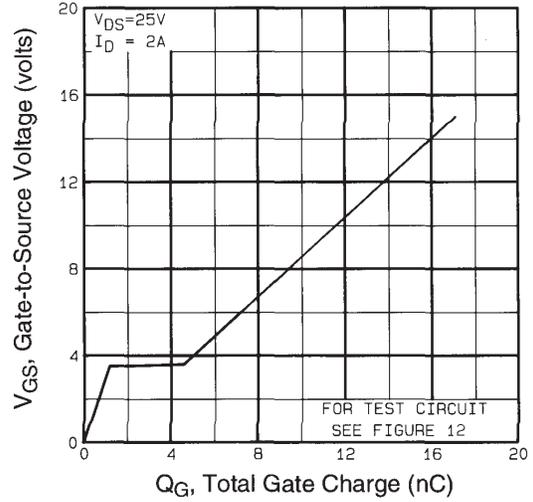
**Fig 4.** Normalized On-Resistance Vs. Temperature

# IRF7103PbF

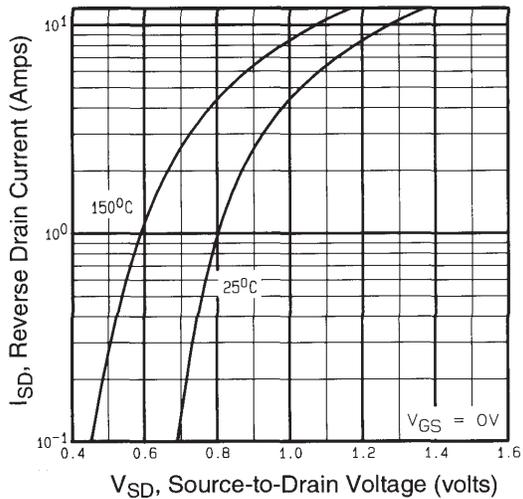
International  
**IR** Rectifier



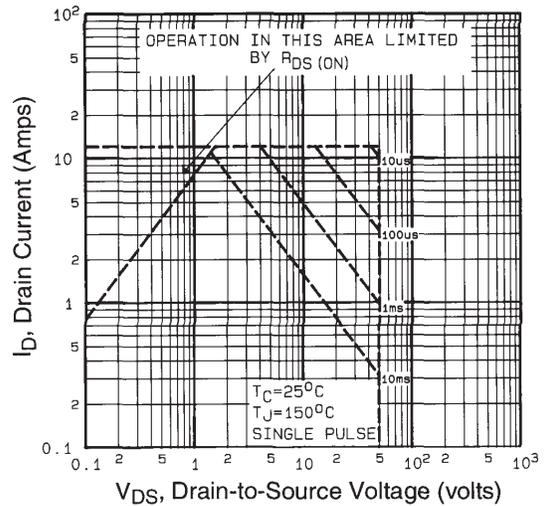
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



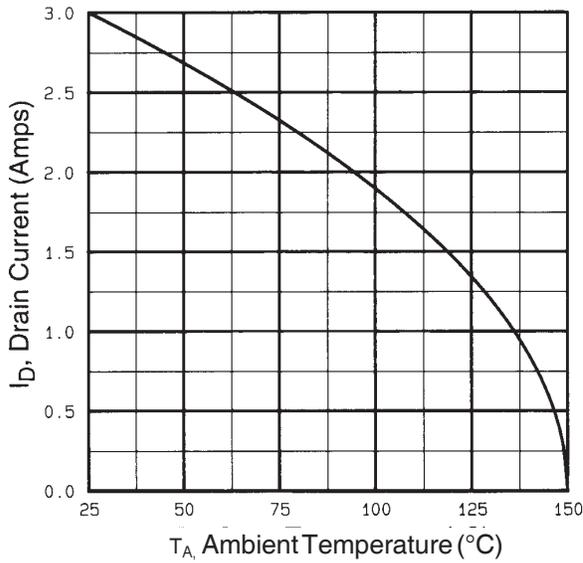
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



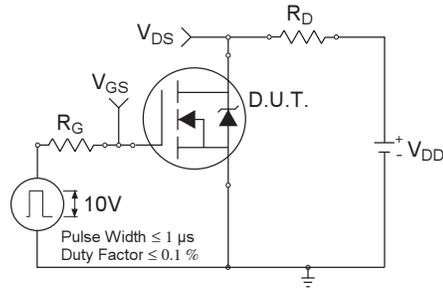
**Fig 7.** Typical Source-Drain Diode Forward Voltage



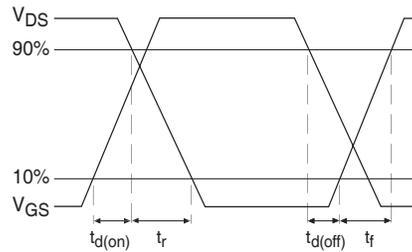
**Fig 8.** Maximum Safe Operating Area



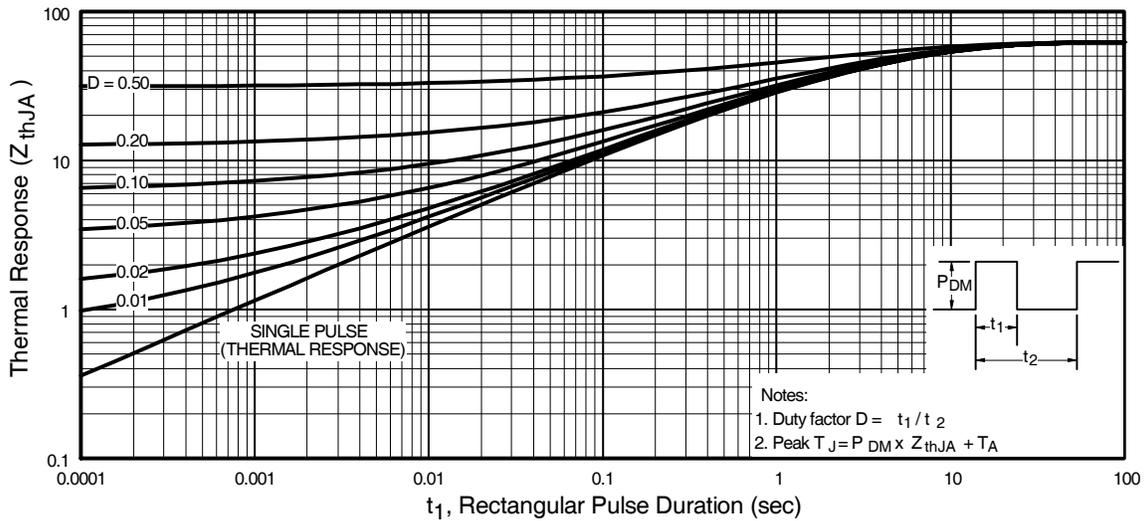
**Fig 9.** Maximum Drain Current Vs. Ambient Temperature



**Fig 10a.** Switching Time Test Circuit



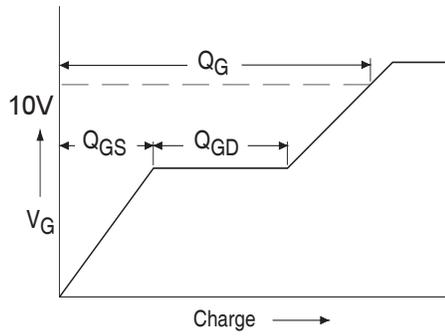
**Fig 10b.** Switching Time Waveforms



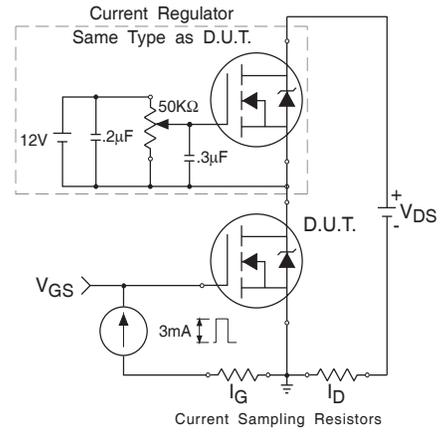
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

# IRF7103PbF

International  
**IR** Rectifier

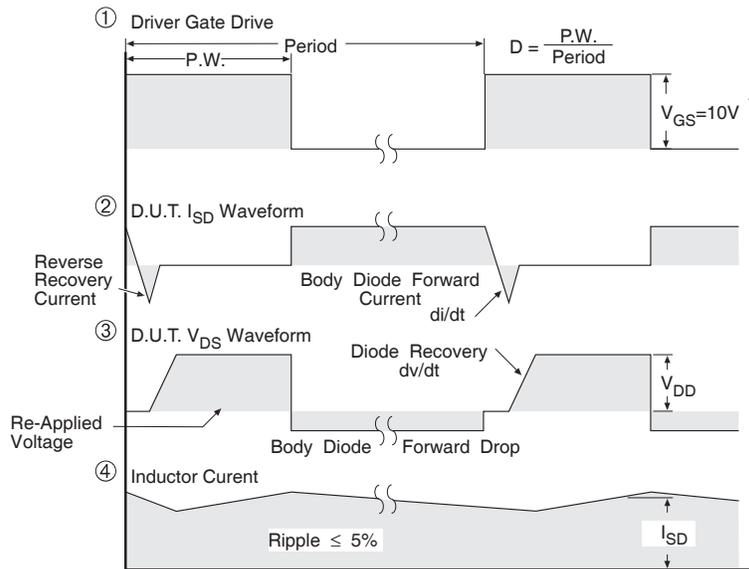
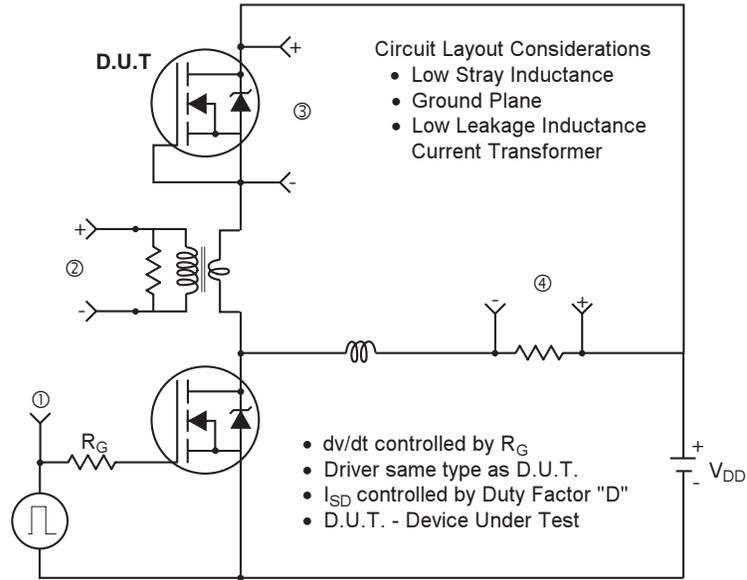


**Fig 12a.** Basic Gate Charge Waveform



**Fig 12b.** Gate Charge Test Circuit

## Peak Diode Recovery dv/dt Test Circuit

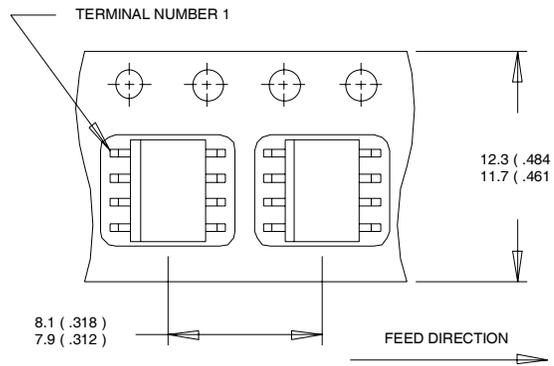


\*  $V_{GS} = 5V$  for Logic Level Devices

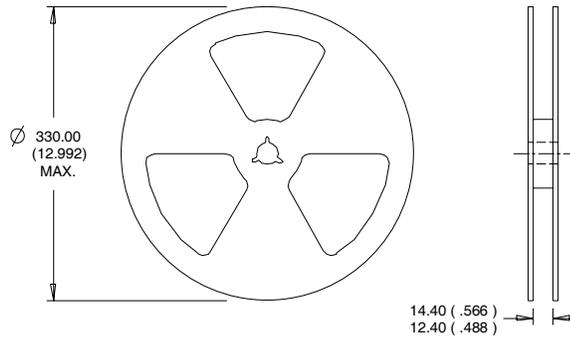
**Fig 13.** For N-Channel HEXFETS



## SO-8 Tape and Reel (Dimensions are shown in millimeters (inches))



- NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
  2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
  3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



- NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
  2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

Data and specifications subject to change without notice.  
 This product has been designed and qualified for the Consumer market.  
 Qualifications Standards can be found on IR's Web site.



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

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.