

NTLUS4930N

Power MOSFET

30 V, 6.1 A, Single N-Channel,
2.0x2.0x0.55 mm μ Cool™ UDFN6 Package

Features

- UDFN Package with Exposed Drain Pads for Excellent Thermal Conduction
- Low Profile UDFN 2.0 x 2.0 x 0.55 mm for Board Space Saving
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Battery Switch
- Power Load Switch
- DC-DC Converters

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise stated)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	30	V
Gate-to-Source Voltage			V_{GS}	± 20	V
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^{\circ}\text{C}$	I_D	6.1	A
		$T_A = 85^{\circ}\text{C}$		4.4	
	$t \leq 5\text{ s}$	$T_A = 25^{\circ}\text{C}$		9.3	
Power Dissipation (Note 1)	Steady State	$T_A = 25^{\circ}\text{C}$	P_D	1.65	W
	$t \leq 5\text{ s}$	$T_A = 25^{\circ}\text{C}$		3.8	
Continuous Drain Current (Note 2)	Steady State	$T_A = 25^{\circ}\text{C}$	I_D	3.8	A
		$T_A = 85^{\circ}\text{C}$		2.8	
Power Dissipation (Note 2)		$T_A = 25^{\circ}\text{C}$	P_D	0.65	W
Pulsed Drain Current		$t_p = 10\text{ }\mu\text{s}$	I_{DM}	19	A
MOSFET Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Source Current (Body Diode) (Note 1)			I_S	1.65	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T_L	260	$^{\circ}\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Surface Mounted on FR4 Board using 1 in sq pad size (Cu area = 1.127 in sq [2 oz] including traces).
2. Surface-mounted on FR4 board using the minimum recommended pad size of 30 mm², 2 oz. Cu.

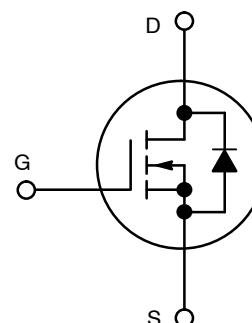


ON Semiconductor®

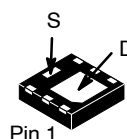
<http://onsemi.com>

MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
30 V	36 m Ω @ 4.5 V	6.1 A
	28.5 m Ω @ 10 V	5.5 A

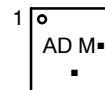


N-CHANNEL MOSFET



MARKING DIAGRAM

UDFN6
(μ COOL™)
CASE 517BG



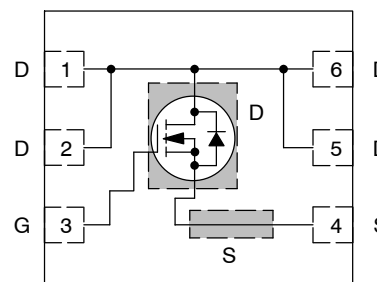
AD = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(*Note: Microdot may be in either location)

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Ambient – Steady State (Note 3)	$R_{\theta JA}$	75.7	°C/W
Junction-to-Ambient – $t \leq 5$ s (Note 3)	$R_{\theta JA}$	32.9	
Junction-to-Ambient – Steady State min Pad (Note 4)	$R_{\theta JA}$	191.4	

3. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [2 oz] including traces).
 4. Surface-mounted on FR4 board using the minimum recommended pad size of 30 mm², 2 oz. Cu.

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0$ V, $I_D = 250$ μ A	30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	$I_D = 250$ μ A, ref to 25°C		+16		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0$ V, $V_{DS} = 24$ V			1.0	μ A
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ V			10	μ A

ON CHARACTERISTICS (Note 5)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}$, $I_D = 250$ μ A	1.2	1.8	2.2	V
Negative Threshold Temp. Coefficient	$V_{GS(TH)}/T_J$			4.4		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 6.1$ A		19	28.5	m Ω
		$V_{GS} = 4.5$ V, $I_D = 5.5$ A		27	36	
Forward Transconductance	g_{FS}	$V_{DS} = 1.5$ V, $I_D = 6.0$ A		16		S

CHARGES, CAPACITANCES & GATE RESISTANCE

Input Capacitance	C_{ISS}	$V_{GS} = 0$ V, $f = 1$ MHz, $V_{DS} = 15$ V		476		pF
Output Capacitance	C_{OSS}			197		
Reverse Transfer Capacitance	C_{RSS}			100		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5$ V, $V_{DS} = 15$ V; $I_D = 5.5$ A		4.8		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.4		
Gate-to-Source Charge	Q_{GS}			1.54		
Gate-to-Drain Charge	Q_{GD}			2.15		
	$Q_{G(TOT)}$	$V_{GS} = 10$ V, $V_{DS} = 15$ V; $I_D = 5.5$ A		8.7		nC

SWITCHING CHARACTERISTICS, $V_{GS} = 4.5$ V (Note 6)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 4.5$ V, $V_{DD} = 15$ V, $I_D = 5.5$ A, $R_G = 3$ Ω		8.7		ns
Rise Time	t_r			14.4		
Turn-Off Delay Time	$t_{d(OFF)}$			9.1		
Fall Time	t_f			3.3		

SWITCHING CHARACTERISTICS, $V_{GS} = 10$ V (Note 6)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 10$ V, $V_{DD} = 15$ V, $I_D = 6.1$ A, $R_G = 3$ Ω		4.1		ns
Rise Time	t_r			12.2		
Turn-Off Delay Time	$t_{d(OFF)}$			11.6		
Fall Time	t_f			2.2		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0$ V, $I_S = 1.65$ A	$T_J = 25^\circ\text{C}$		0.80	1.0	V
			$T_J = 125^\circ\text{C}$		0.67		

5. Pulse Test: pulse width ≤ 300 μ s, duty cycle $\leq 2\%$.
 6. Switching characteristics are independent of operating junction temperatures.

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
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DRAIN-SOURCE DIODE CHARACTERISTICS

Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dI _S /dt = 100 A/μs, I _S = 3.3 A		14.6		ns
Charge Time	t _a			6.8		
Discharge Time	t _b			7.8		
Reverse Recovery Charge	Q _{RR}			5.4		nC

5. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

6. Switching characteristics are independent of operating junction temperatures.

DEVICE ORDERING INFORMATION

Device	Package	Shipping [†]
NTLUS4930NTAG	UDFN6 (Pb-Free)	3000 / Tape & Reel
NTLUS4930NTBG	UDFN6 (Pb-Free)	3000 / 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.

TYPICAL CHARACTERISTICS

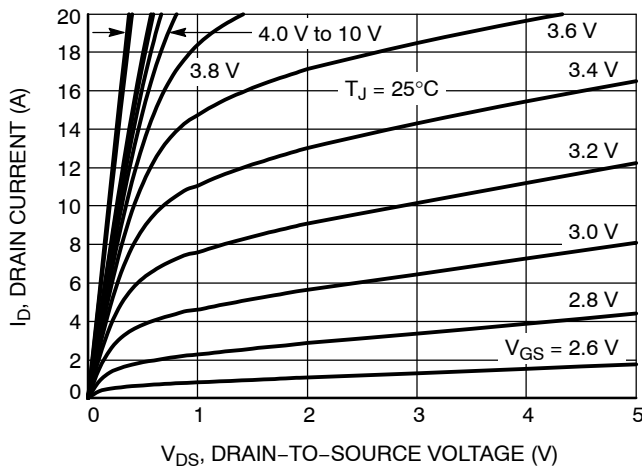


Figure 1. On-Region Characteristics

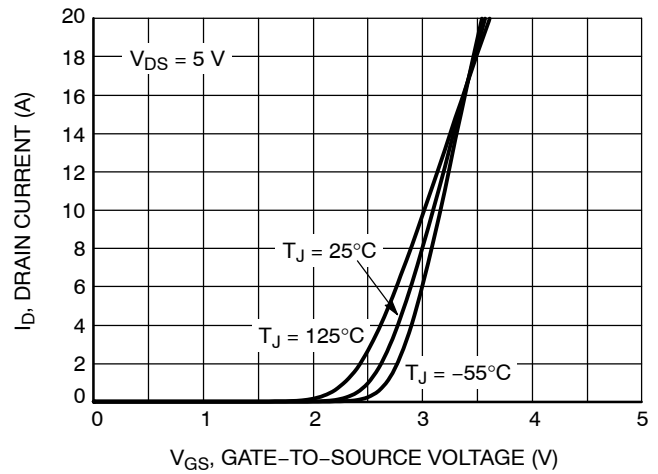


Figure 2. Transfer Characteristics

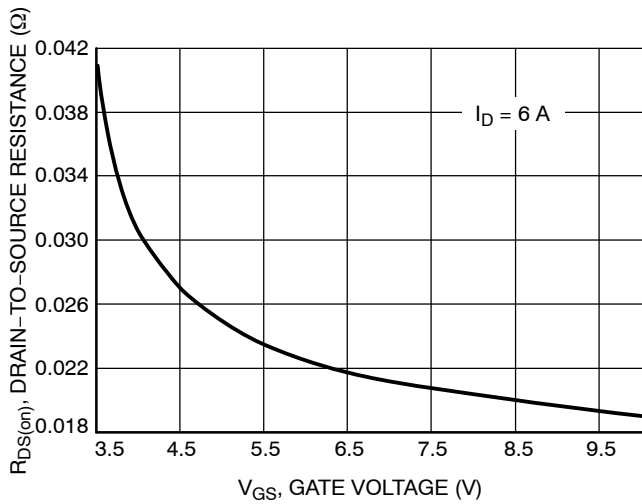


Figure 3. On-Resistance vs. Gate-to-Source Voltage

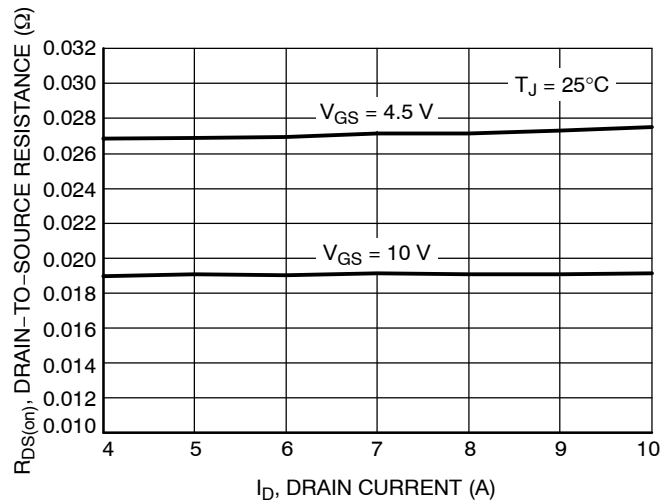


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

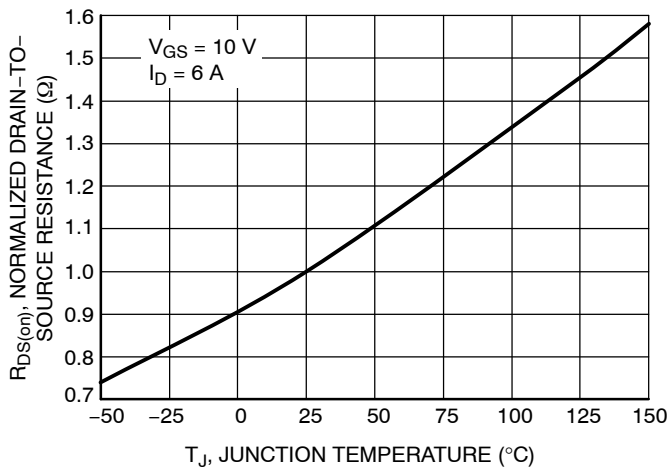


Figure 5. On-Resistance Variation with Temperature

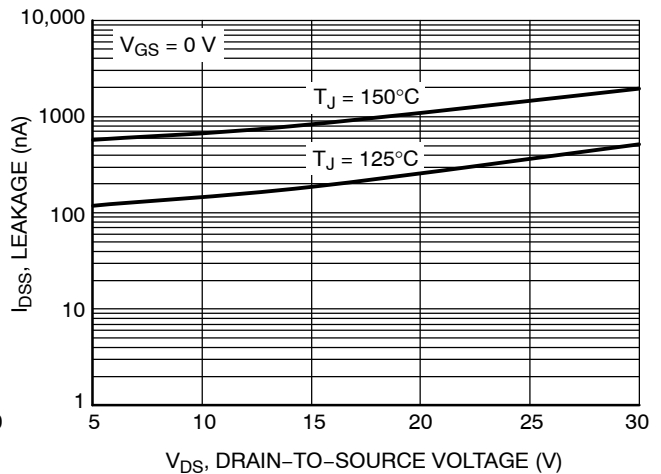


Figure 6. Drain-to-Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS

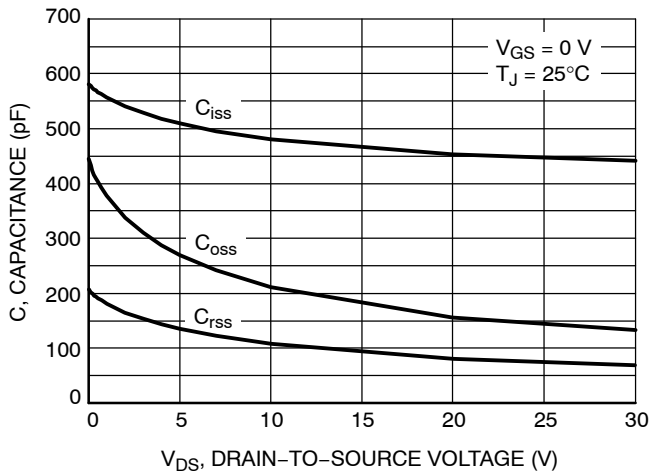


Figure 7. Capacitance Variation

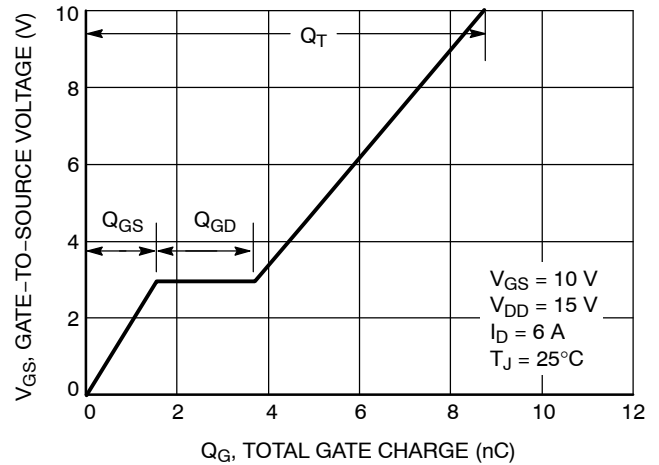


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

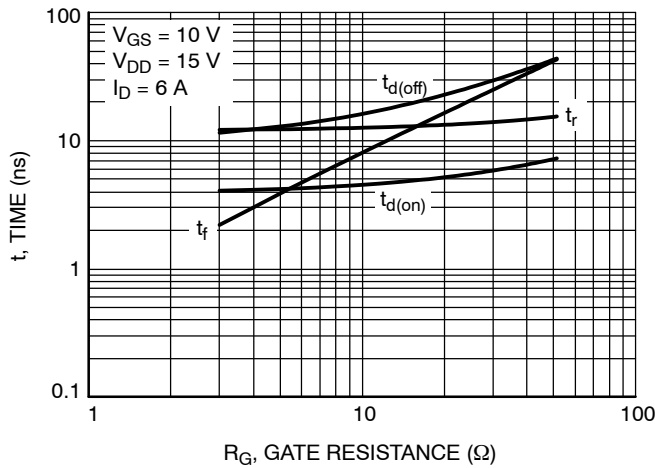


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

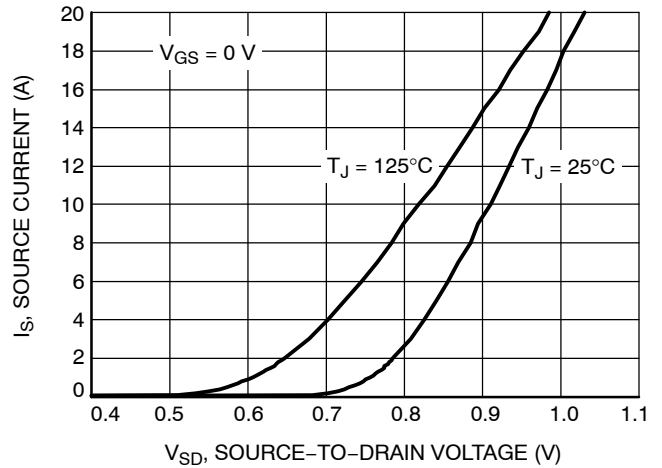


Figure 10. Diode Forward Voltage vs. Current

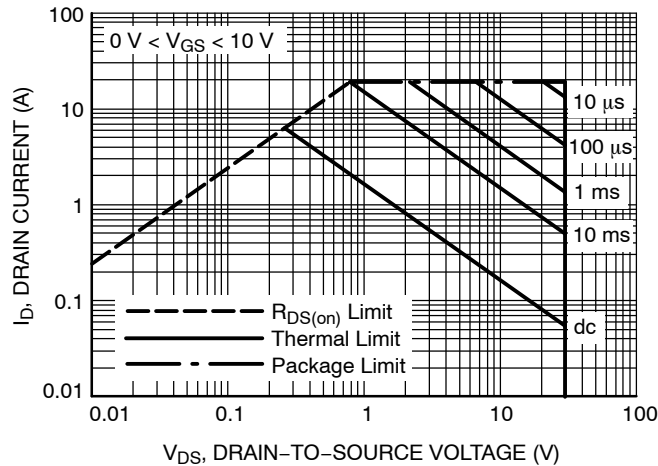


Figure 11. Maximum Rated Forward Biased Safe Operating Area

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TYPICAL CHARACTERISTICS

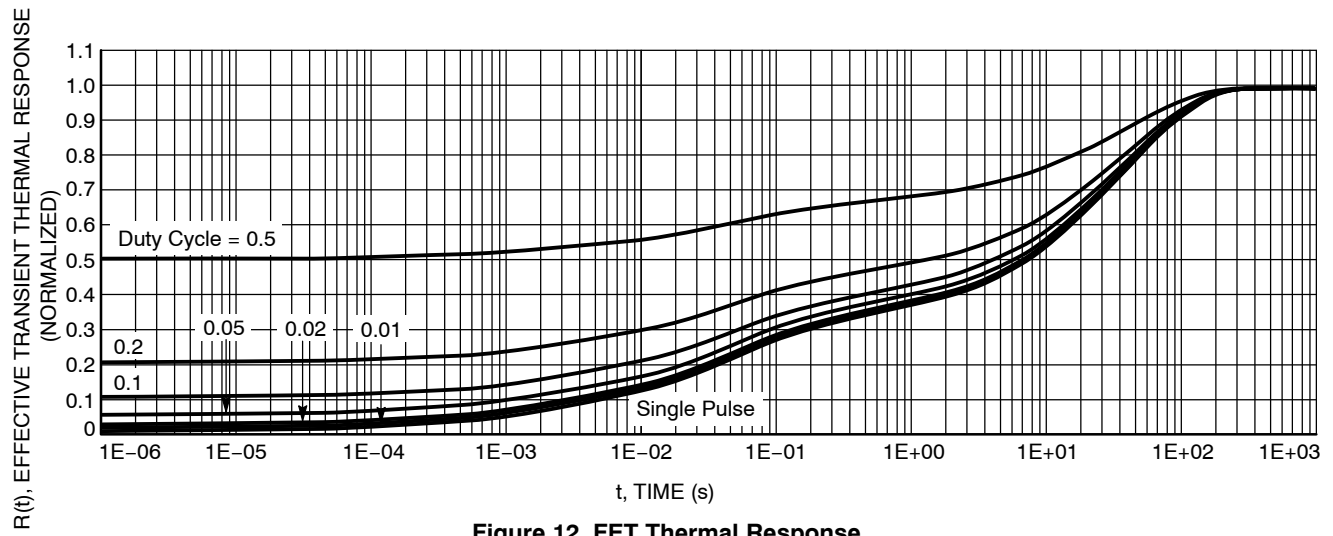


Figure 12. FET Thermal Response



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

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