

NVTFS4C10N

Power MOSFET

30 V, 7.4 mΩ, 47 A, Single N-Channel,
μ8FL

Features

- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- NVTFS4C10NWF – Wetable Flanks Product
- NVT Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

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 $R_{\theta JA}$ (Notes 1, 2, 4)	Steady State	$T_A = 25^{\circ}\text{C}$	I_D	15.3	A
		$T_A = 100^{\circ}\text{C}$		10.8	
$T_A = 25^{\circ}\text{C}$		P_D	3.0	W	
$T_A = 100^{\circ}\text{C}$			1.5		
Continuous Drain Current $R_{\psi JC}$ (Notes 1, 3, 4)		$T_C = 25^{\circ}\text{C}$	I_D	47	A
		$T_C = 100^{\circ}\text{C}$		33	
Power Dissipation $R_{\psi JC}$ (Notes 1, 3, 4)		$T_C = 25^{\circ}\text{C}$	P_D	28	W
		$T_C = 100^{\circ}\text{C}$		14	W
Pulsed Drain Current	$T_A = 25^{\circ}\text{C}$, $t_p = 10\text{ }\mu\text{s}$		I_{DM}	196	A
Operating Junction and Storage Temperature			T_J , T_{stg}	-55 to +175	$^{\circ}\text{C}$
Source Current (Body Diode)			I_S	53	A
Single Pulse Drain-to-Source Avalanche Energy ($T_J = 25^{\circ}\text{C}$, $V_{GS} = 10\text{ V}$, $I_L = 10.2\text{ A}$, $L = 0.5\text{ mH}$)			E_{AS}	26	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T_L	260	$^{\circ}\text{C}$

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.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case (Drain) (Notes 1, 3)	$R_{\theta JC}$	5.4	$^\circ\text{C/W}$
Junction-to-Ambient – Steady State (Notes 1, 2)	$R_{\theta JA}$	50	

1. The entire application environment impacts the thermal resistance values shown; they are not constants and are valid for the specific conditions noted.
2. Surface-mounted on FR4 board using 650 mm², 2 oz. Cu Pad.
3. Assumes heat-sink sufficiently large to maintain constant case temperature independent of device power.
4. Continuous DC current rating. Maximum current for pulses as long as one second is higher but dependent on pulse duration and duty cycle.

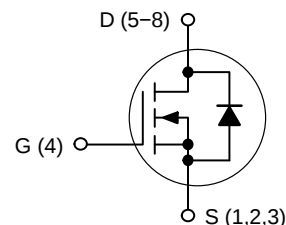


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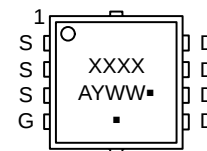
$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
30 V	7.4 mΩ @ 10 V	47 A
	11 mΩ @ 4.5 V	

N-Channel MOSFET



WDFN8
(μ8FL)
CASE 511AB

MARKING DIAGRAM



4C10 = Specific Device Code for NVMTS4C10N

10WF = Specific Device Code of NVTFS4C10NWF

A = Assembly Location

Y = Year

WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NVTFS4C10N

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} /T _J			14.5		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = 24 V	T _J = 25°C		1.0	μA
			T _J = 125°C		10	
Gate-to-Source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA

ON CHARACTERISTICS (Note 5)

Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250 μA	1.3		2.2	V
Threshold Temperature Coefficient	V _{GS(TH)} /T _J			-4.5		mV/°C
Drain-to-Source On Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		5.9	7.4	mΩ
		V _{GS} = 4.5 V, I _D = 15 A		8.8	11	
Forward Transconductance	g _{FS}	V _{DS} = 1.5 V, I _D = 15 A		43		S
Gate Resistance	R _G	T _A = 25°C		1.0		Ω

CHARGES AND CAPACITANCES

Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1 MHz, V _{DS} = 15 V		993		pF
Output Capacitance	C _{OSS}			574		
Reverse Transfer Capacitance	C _{RSS}			163		
Capacitance Ratio	C _{RSS} /C _{ISS}	V _{GS} = 0 V, V _{DS} = 15 V, f = 1 MHz		0.164		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 15 V, I _D = 30 A		10.1		nC
Threshold Gate Charge	Q _{G(TH)}			1.8		
Gate-to-Source Charge	Q _{GS}			2.6		
Gate-to-Drain Charge	Q _{GD}			6.1		
Gate Plateau Voltage	V _{GP}			3.2		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 10 V, V _{DS} = 15 V, I _D = 30 A		19.3		nC

SWITCHING CHARACTERISTICS (Note 6)

Turn-On Delay Time	t _{d(ON)}	V _{GS} = 4.5 V, V _{DS} = 15 V, I _D = 15 A, R _G = 3.0 Ω		9.0		ns
Rise Time	t _r			30		
Turn-Off Delay Time	t _{d(OFF)}			14		
Fall Time	t _f			7.0		
Turn-On Delay Time	t _{d(ON)}	V _{GS} = 10 V, V _{DS} = 15 V, I _D = 15 A, R _G = 3.0 Ω		6.0		ns
Rise Time	t _r			25		
Turn-Off Delay Time	t _{d(OFF)}			18		
Fall Time	t _f			4.0		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V _{SD}	V _{GS} = 0 V, I _S = 10 A	T _J = 25°C		0.80	1.1	V
			T _J = 125°C		0.67		
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dI _S /dt = 100 A/μs, I _S = 30 A		23.3			ns
Charge Time	t _a			12.7			
Discharge Time	t _b			10.6			
Reverse Recovery Charge	Q _{RR}			8.3			nC

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

6. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

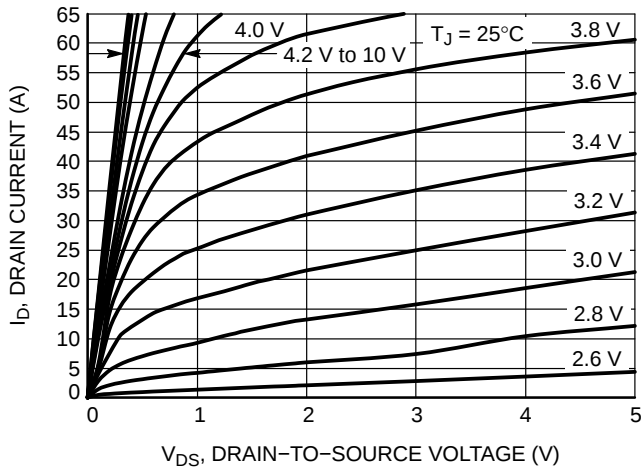


Figure 1. On-Region Characteristics

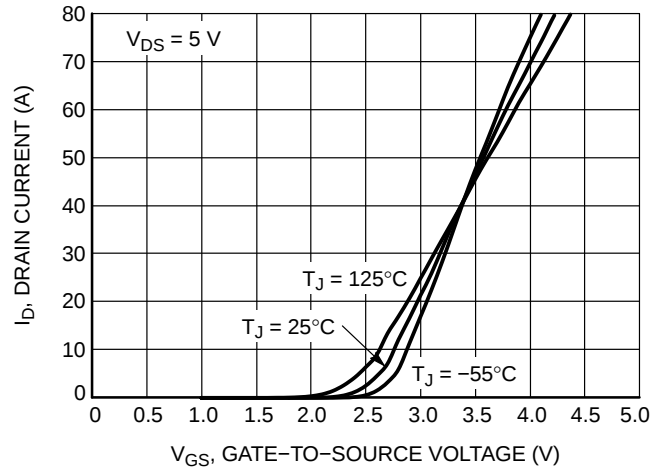


Figure 2. Transfer Characteristics

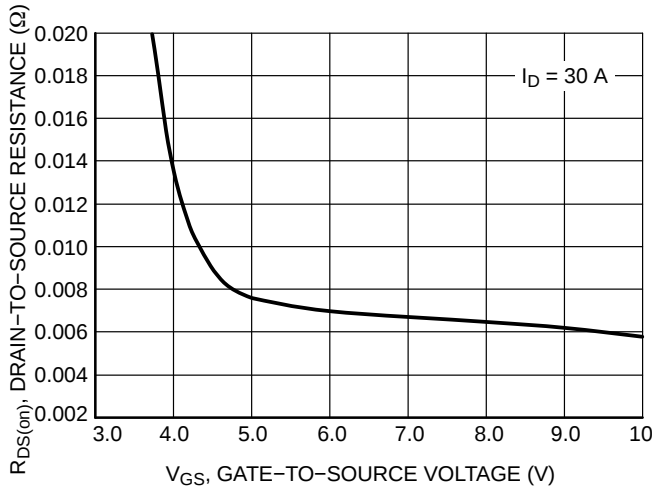


Figure 3. On-Resistance vs. V_{GS}

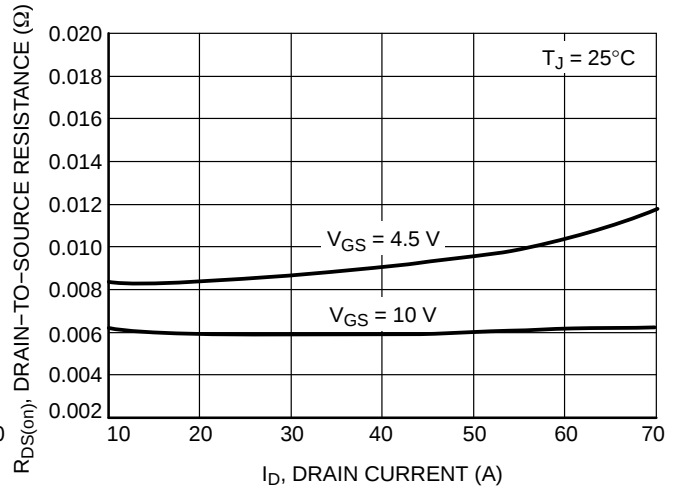


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

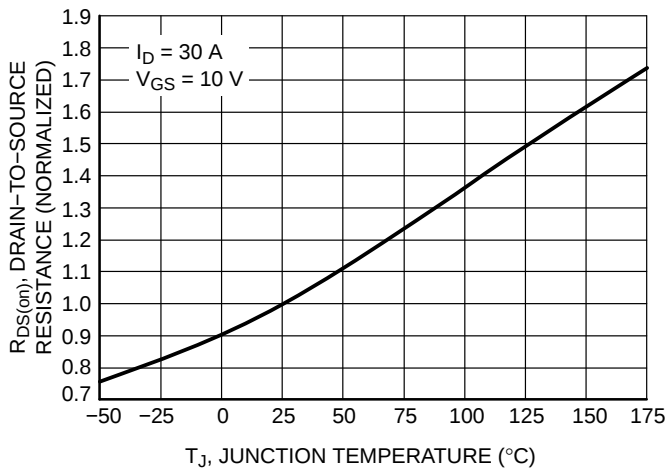


Figure 5. On-Resistance Variation with Temperature

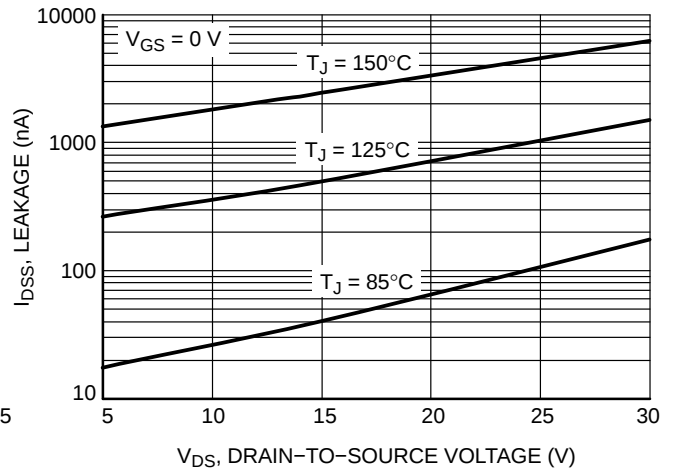


Figure 6. Drain-to-Source Leakage Current vs. Voltage

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TYPICAL CHARACTERISTICS

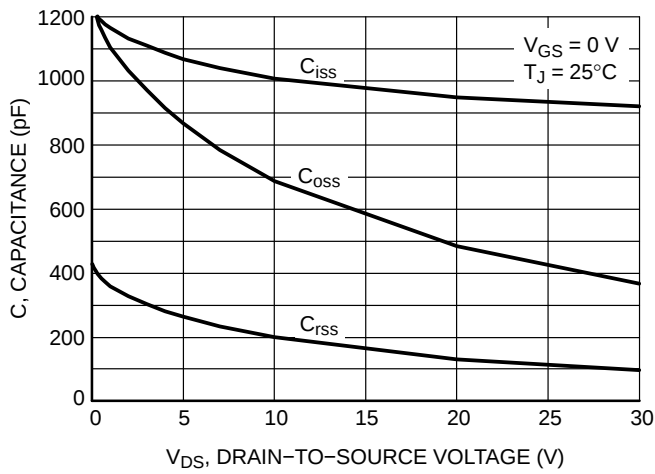


Figure 7. Capacitance Variation

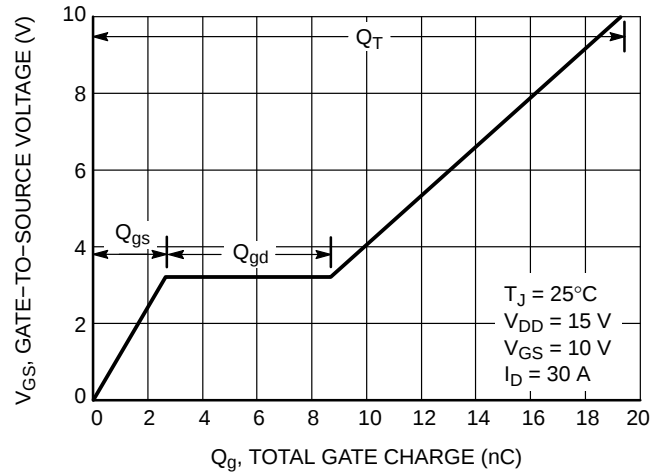


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

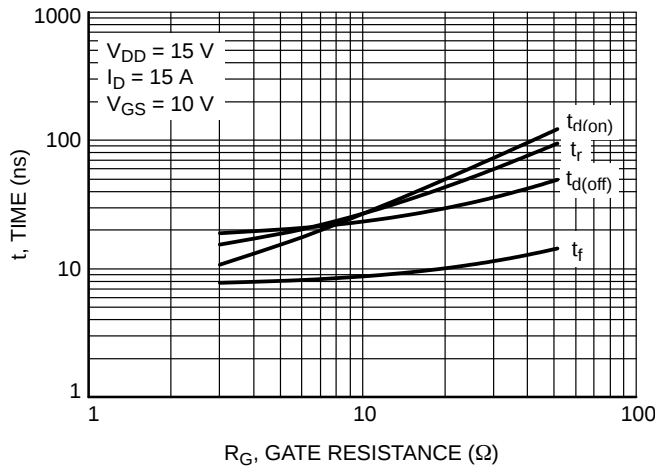


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

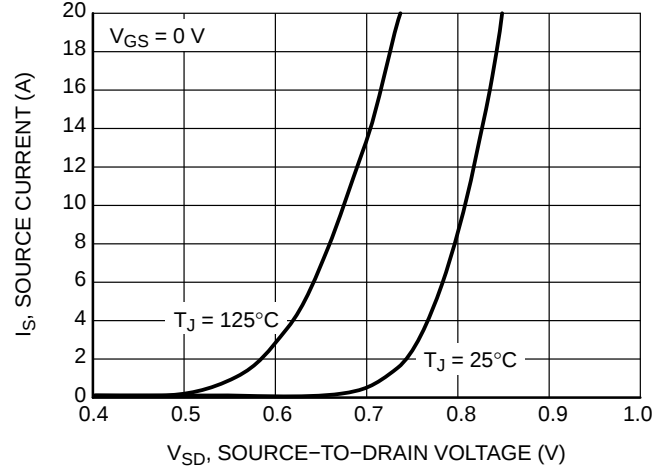


Figure 10. Diode Forward Voltage vs. Current

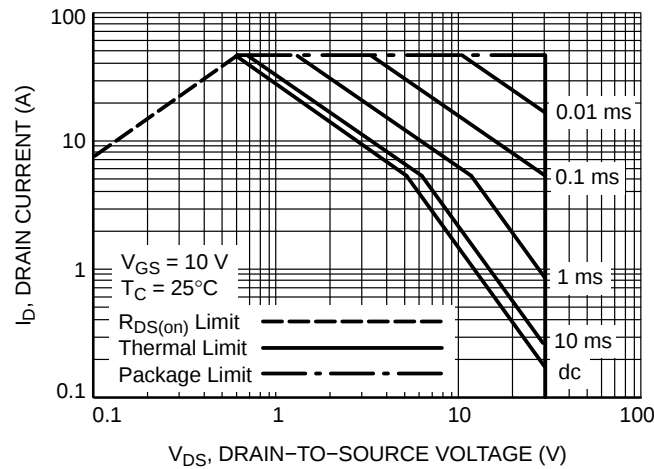


Figure 11. Maximum Rated Forward Biased Safe Operating Area

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TYPICAL CHARACTERISTICS

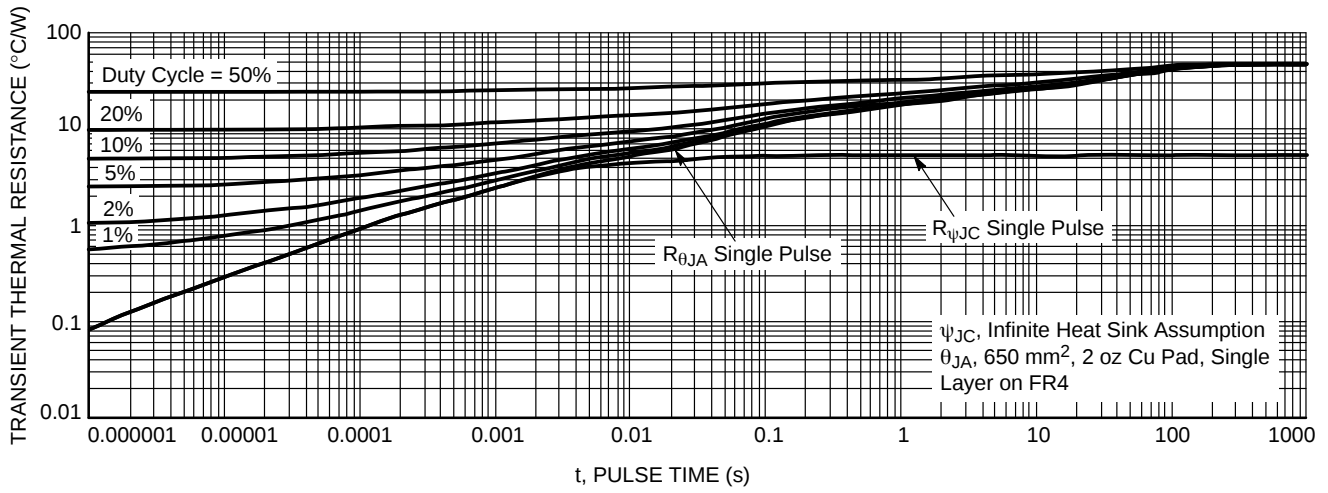


Figure 12. Thermal Response

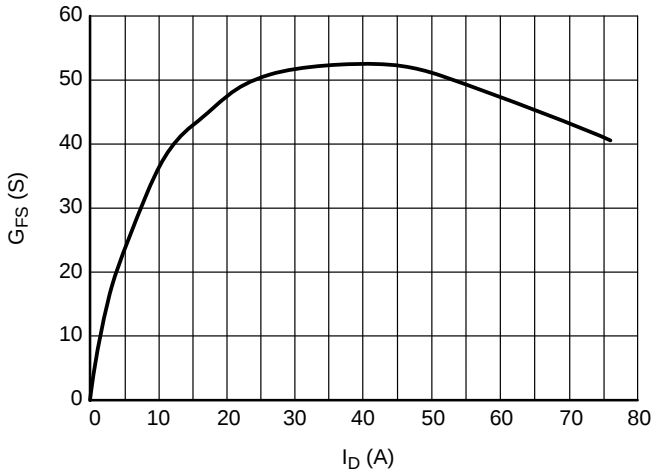


Figure 13. G_{FS} vs. I_D

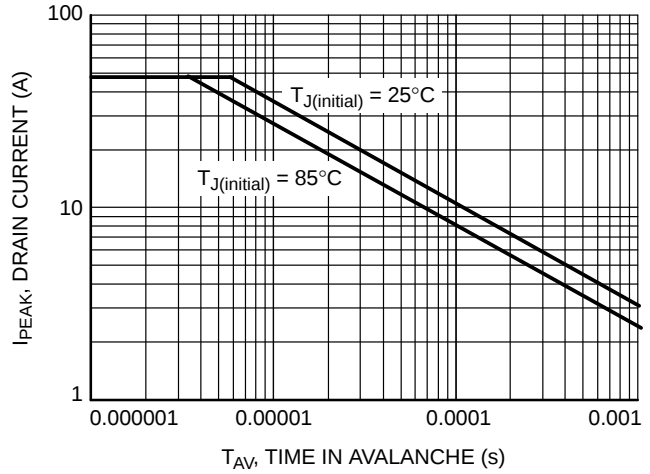


Figure 14. Avalanche Characteristics

ORDERING INFORMATION

Device	Package	Shipping [†]
NVTFS4C10NTAG	WDFN8 (Pb-Free)	1500 / Tape & Reel
NVTFS4C10NWFTAG	WDFN8 (Pb-Free)	1500 / 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.



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- 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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