

NTMFS4845N

Power MOSFET

30 V, 115 A, Single N-Channel, SO-8FL

Features

- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- Thermally Enhanced SO-8 Package
- These are Pb-Free Devices

Applications

- Refer to Application Note AND8195/D
- CPU Power Delivery
- DC-DC Converters
- Low Side Switching

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}	± 16	V
Continuous Drain Current $R_{\theta JA}$ (Note 1)	Steady State	$T_A = 25^{\circ}\text{C}$	I_D	22	A
		$T_A = 85^{\circ}\text{C}$		15.8	
Power Dissipation $R_{\theta JA}$ (Note 1)		$T_A = 25^{\circ}\text{C}$	P_D	2.27	W
Continuous Drain Current $R_{\theta JA} \leq 10 \text{ sec}$		$T_A = 25^{\circ}\text{C}$	I_D	35.5	A
		$T_A = 85^{\circ}\text{C}$		25.6	
Power Dissipation $R_{\theta JA}, t \leq 10 \text{ sec}$		$T_A = 25^{\circ}\text{C}$	P_D	5.95	W
Continuous Drain Current $R_{\theta JA}$ (Note 2)		$T_A = 25^{\circ}\text{C}$	I_D	13.7	A
		$T_A = 85^{\circ}\text{C}$		9.9	
Power Dissipation $R_{\theta JA}$ (Note 2)		$T_A = 25^{\circ}\text{C}$	P_D	0.89	W
Continuous Drain Current $R_{\theta JC}$ (Note 1)		$T_C = 25^{\circ}\text{C}$	I_D	115	A
		$T_C = 85^{\circ}\text{C}$		83	
Power Dissipation $R_{\theta JC}$ (Note 1)		$T_C = 25^{\circ}\text{C}$	P_D	62.5	W
Pulsed Drain Current	$t_p=10\mu\text{s}$	$T_A = 25^{\circ}\text{C}$	I_{DM}	230	A
Current limited by package		$T_A = 25^{\circ}\text{C}$	$I_{Dmaxpkg}$	100	A
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$
Source Current (Body Diode)			I_S	62	A
Drain to Source dV/dt			dV/dt	6	V/ns
Single Pulse Drain-to-Source Avalanche Energy ($V_{DD} = 50 \text{ V}, V_{GS} = 10 \text{ V}, I_L = 39 \text{ A}_{pk}, L = 0.3 \text{ mH}, R_G = 25 \Omega$)			EAS	228	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T_L	260	$^{\circ}\text{C}$

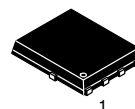
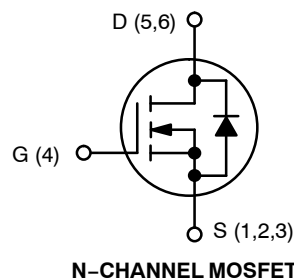
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



ON Semiconductor®

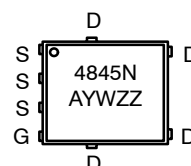
<http://onsemi.com>

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ MAX}$	$I_D \text{ MAX}$
30 V	2.9 m Ω @ 10 V	115 A
	4.4 m Ω @ 4.5 V	



SO-8 FLAT LEAD
CASE 488AA
STYLE 1

MARKING DIAGRAM



A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping†
NTMFS4845NT1G	SO-8FL (Pb-Free)	1500 / Tape & Reel
NTMFS4845NT3G	SO-8FL (Pb-Free)	5000 / 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.

NTMFS4845N

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case (Drain)	$R_{\theta JC}$	2.0	°C/W
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	55.1	
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	140.1	
Junction-to-Ambient – $t \leq 10$ sec	$R_{\theta JA}$	21	

1. Surface-mounted on FR4 board using 1 sq-in pad, 1 oz Cu.
2. Surface-mounted on FR4 board using the minimum recommended pad size.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
-----------	--------	----------------	-----	-----	-----	------

OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			25		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 24\text{ V}$	$T_J = 25^\circ\text{C}$		1	μA
			$T_J = 125^\circ\text{C}$		10	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 16\text{ V}$			± 100	nA

ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\text{ }\mu\text{A}$	1.45	1.8	2.5	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			5.2		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V to } 11.5\text{ V}$	$I_D = 30\text{ A}$	2.2	2.9	m Ω
			$I_D = 15\text{ A}$	2.2		
		$V_{GS} = 4.5\text{ V}$	$I_D = 30\text{ A}$	3.4	4.4	
			$I_D = 15\text{ A}$	3.4		
Forward Transconductance	g_{FS}	$V_{DS} = 1.5\text{ V}, I_D = 30\text{ A}$		87		S

CHARGES AND CAPACITANCES

Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1\text{ MHz}, V_{DS} = 12\text{ V}$		3720		pF
Output Capacitance	C_{OSS}			650		
Reverse Transfer Capacitance	C_{RSS}			335		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 15\text{ V}; I_D = 30\text{ A}$		25.6	39	nC
Threshold Gate Charge	$Q_{G(TH)}$			3.2		
Gate-to-Source Charge	Q_{GS}			9.4		
Gate-to-Drain Charge	Q_{GD}			8.6		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 11.5\text{ V}, V_{DS} = 15\text{ V}, I_D = 30\text{ A}$		62		nC

SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 15\text{ V}, I_D = 15\text{ A}, R_G = 3.0\text{ }\Omega$		20.5		ns
Rise Time	t_r			48.4		
Turn-Off Delay Time	$t_{d(OFF)}$			28.9		
Fall Time	t_f			12.2		

3. Pulse Test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
4. Switching characteristics are independent of operating junction temperatures.

NTMFS4845N

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
SWITCHING CHARACTERISTICS (Note 4)						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 11.5\text{ V}, V_{DS} = 15\text{ V},$ $I_D = 15\text{ A}, R_G = 3.0\ \Omega$		12.5		ns
Rise Time	t_r			27.1		
Turn-Off Delay Time	$t_{d(OFF)}$			37.7		
Fall Time	t_f			9.7		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V},$ $I_S = 30\text{ A}$	$T_J = 25^\circ\text{C}$		0.8	1.0	V
			$T_J = 125^\circ\text{C}$		0.7		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s},$ $I_S = 30\text{ A}$			20.8		ns
Charge Time	t_a				12.6		
Discharge Time	t_b				8.2		
Reverse Recovery Charge	Q_{RR}				9.0		nC

PACKAGE PARASITIC VALUES

Source Inductance	L_S	$T_A = 25^\circ\text{C}$		0.65		nH
Drain Inductance	L_D			0.005		
Gate Inductance	L_G			1.84		
Gate Resistance	R_G			1.3	2.5	Ω

- Pulse Test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

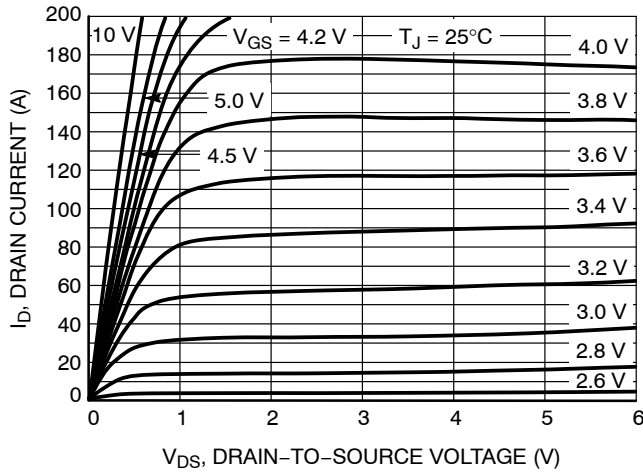


Figure 1. On-Region Characteristics

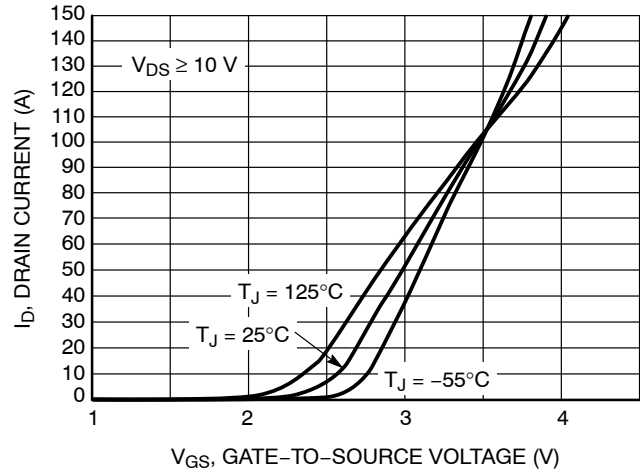


Figure 2. Transfer Characteristics

TYPICAL CHARACTERISTICS

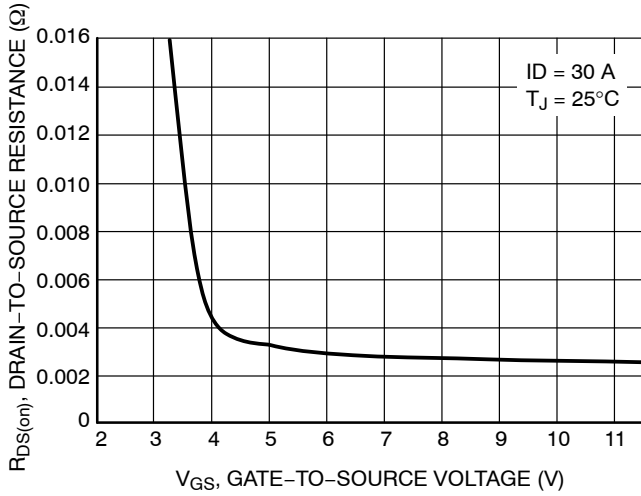


Figure 3. On-Resistance vs. Gate-to-Source Voltage

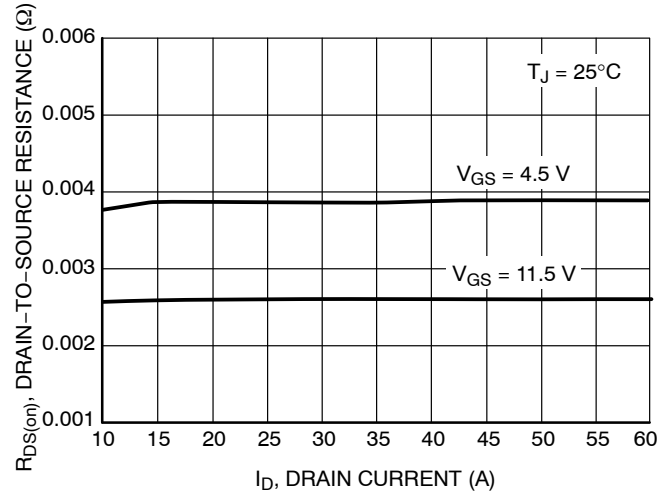


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

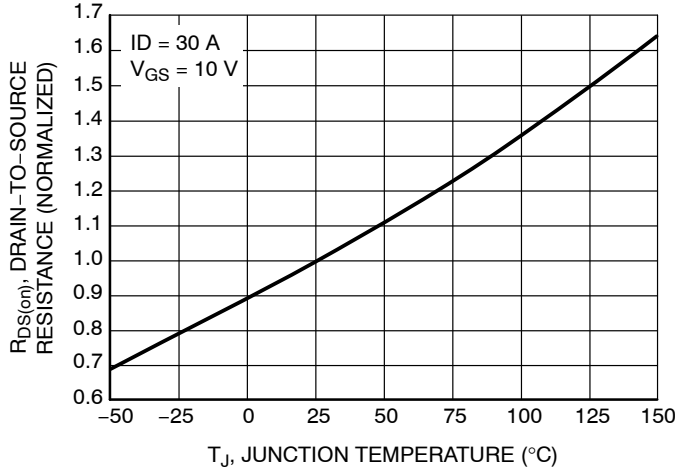


Figure 5. On-Resistance Variation with Temperature

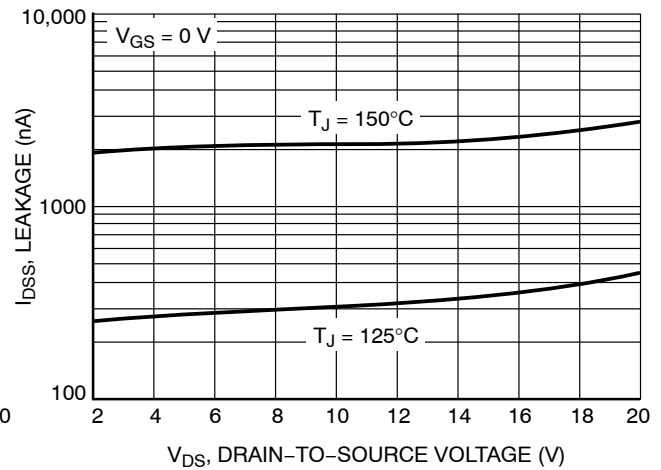


Figure 6. Drain-to-Source Leakage Current vs. Voltage

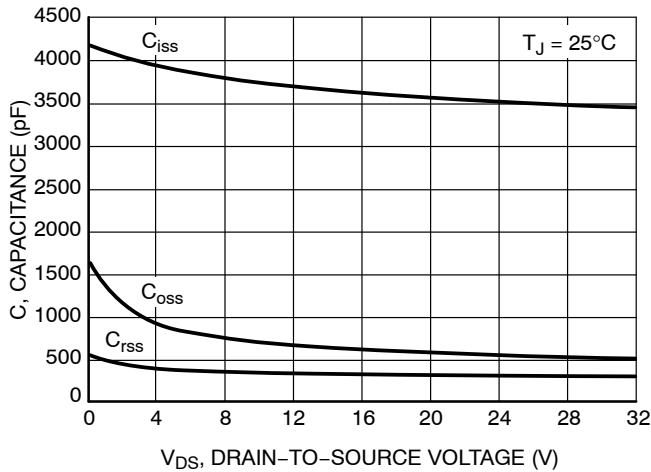


Figure 7. Capacitance Variation

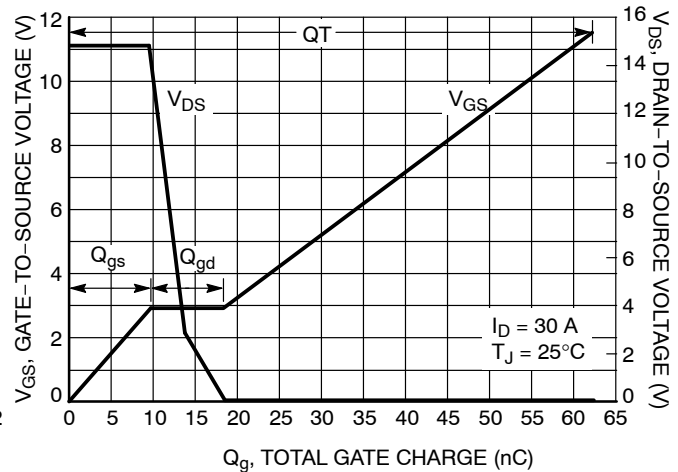


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

TYPICAL CHARACTERISTICS

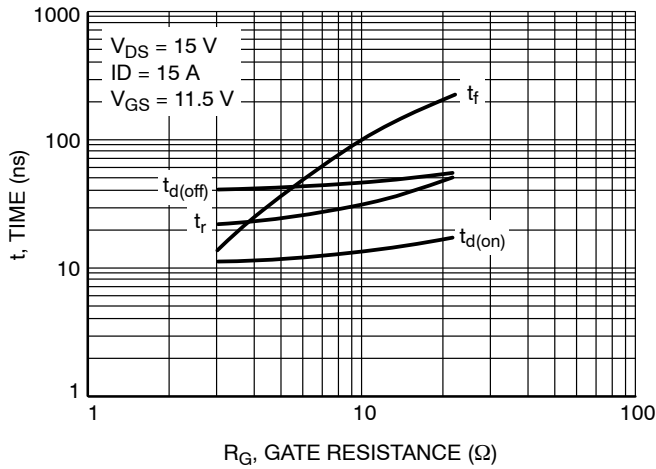


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

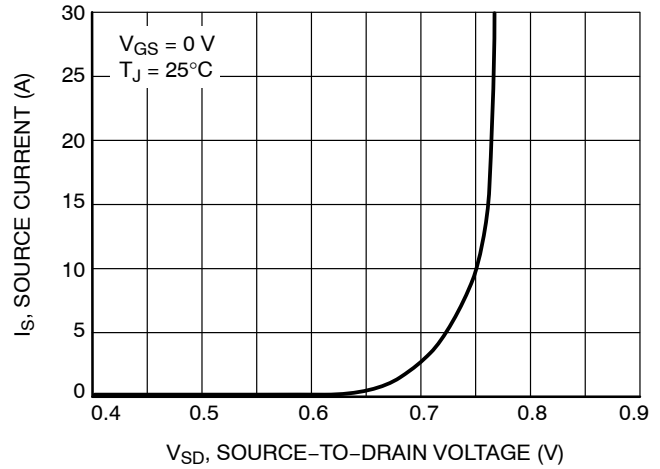


Figure 10. Diode Forward Voltage vs. Current

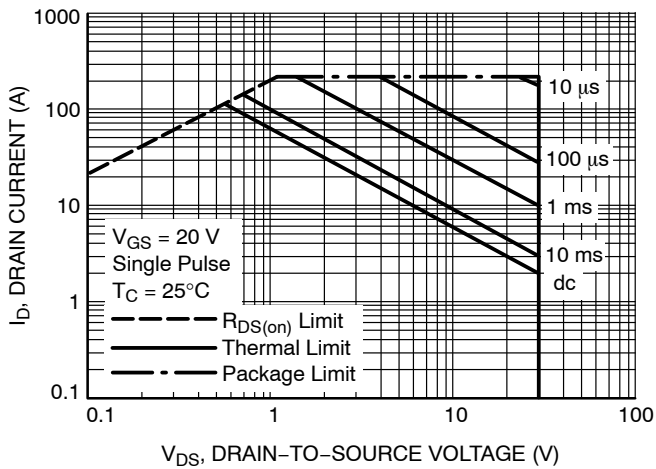


Figure 11. Maximum Rated Forward Biased Safe Operating Area

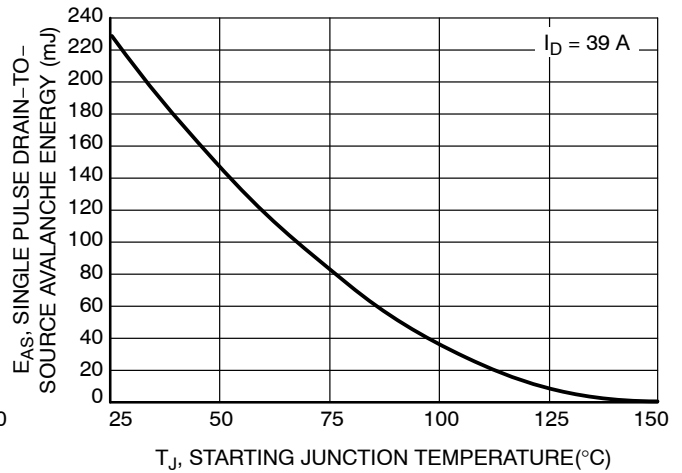


Figure 12. Maximum Avalanche Energy vs. Starting Junction Temperature

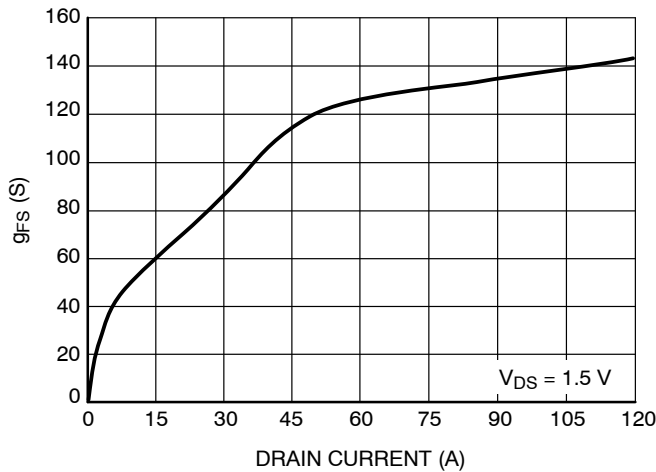


Figure 13. g_{FS} vs. Drain Current

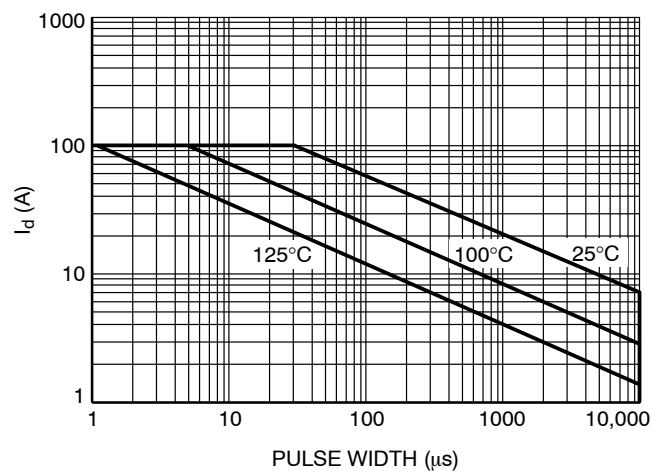


Figure 14. I_d vs. Pulse Width



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

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