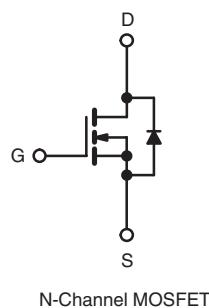
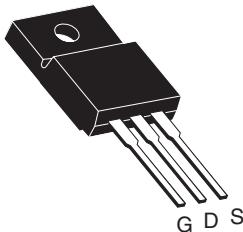


# Power MOSFET

PRODUCT SUMMARY	
V <sub>DS</sub> (V)	400
R <sub>D(on)</sub> (Ω)	V <sub>GS</sub> = 10 V      0.55
Q <sub>g</sub> (Max.) (nC)	66
Q <sub>gs</sub> (nC)	10
Q <sub>gd</sub> (nC)	33
Configuration	Single

**TO-220 FULLPAK**


## ORDERING INFORMATION

Package	TO-220 FULLPAK
Lead (Pb)-free	IRFI740GPbF SiHFI740G-E3
SnPb	IRFI740G SiHFI740G

## ABSOLUTE MAXIMUM RATINGS T<sub>C</sub> = 25 °C, unless otherwise noted

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DS</sub>	400	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current	I <sub>D</sub>	5.4	A
		3.4	
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	22	
Linear Derating Factor		0.32	W/°C
Single Pulse Avalanche Energy <sup>b</sup>	E <sub>AS</sub>	390	mJ
Repetitive Avalanche Current <sup>a</sup>	I <sub>AR</sub>	5.4	A
Repetitive Avalanche Energya	E <sub>AR</sub>	4.0	mJ
Maximum Power Dissipation	P <sub>D</sub>	40	W
Peak Diode Recovery dV/dt <sup>c</sup>	dV/dt	4.0	V/ns
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to + 150	°C
Soldering Recommendations (Peak Temperature)	for 10 s	300 <sup>d</sup>	
Mounting Torque	6-32 or M3 screw	10	lbf · in
		1.1	N · m

### Notes

- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- b. V<sub>DD</sub> = 50 V, starting T<sub>J</sub> = 25 °C, L = 23 mH, R<sub>g</sub> = 25 Ω, I<sub>AS</sub> = 5.4 A (see fig. 12).
- c. I<sub>SD</sub> ≤ 10 A, dI/dt ≤ 120 A/μs, V<sub>DD</sub> ≤ V<sub>DS</sub>, T<sub>J</sub> ≤ 150 °C.
- d. 1.6 mm from case.

\* Pb containing terminations are not RoHS compliant, exemptions may apply


**RoHS\***  
COMPLIANT

**THERMAL RESISTANCE RATINGS**

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient	R <sub>thJA</sub>	-	65	°C/W
Maximum Junction-to-Case (Drain)	R <sub>thJC</sub>	-	3.1	

**SPECIFICATIONS** T<sub>J</sub> = 25 °C, unless otherwise noted

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
<b>Static</b>							
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA		400	-	-	V
V <sub>DS</sub> Temperature Coefficient	ΔV <sub>DS</sub> /T <sub>J</sub>	Reference to 25 °C, I <sub>D</sub> = 1 mA		-	0.49	-	V/°C
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA		2.0	-	4.0	V
Gate-Source Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 400 V, V <sub>GS</sub> = 0 V		-	-	25	μA
		V <sub>DS</sub> = 320 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C		-	-	250	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V	I <sub>D</sub> = 3.2 A <sup>b</sup>	-	-	0.55	Ω
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 50 V, I <sub>D</sub> = 3.2 A <sup>b</sup>		3.6	-	-	S
<b>Dynamic</b>							
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1.0 MHz, see fig. 5		-	1370	-	pF
Output Capacitance	C <sub>oss</sub>			-	380	-	
Reverse Transfer Capacitance	C <sub>rss</sub>			-	140	-	
Drain to Sink Capacitance	C	f = 1.0 MHz		-	12	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 10 V	I <sub>D</sub> = 10 A, V <sub>DS</sub> = 320 V, see fig. 6 and 13 <sup>b</sup>	-	-	66	nC
Gate-Source Charge	Q <sub>gs</sub>			-	-	10	
Gate-Drain Charge	Q <sub>gd</sub>			-	-	33	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 200 V, I <sub>D</sub> = 10 A, R <sub>g</sub> = 9.1 Ω, R <sub>D</sub> = 20 Ω, see fig. 10 <sup>b</sup>		-	14	-	ns
Rise Time	t <sub>r</sub>		-	25	-		
Turn-Off Delay Time	t <sub>d(off)</sub>		-	54	-		
Fall Time	t <sub>f</sub>		-	24	-		
Internal Drain Inductance	L <sub>D</sub>	Between lead, 6 mm (0.25") from package and center of die contact		-	4.5	-	nH
Internal Source Inductance	L <sub>S</sub>			-	7.5	-	
<b>Drain-Source Body Diode Characteristics</b>							
Continuous Source-Drain Diode Current	I <sub>S</sub>	MOSFET symbol showing the integral reverse p - n junction diode		-	-	5.4	A
Pulsed Diode Forward Current <sup>a</sup>	I <sub>SM</sub>			-	-	22	
Body Diode Voltage	V <sub>SD</sub>	T <sub>J</sub> = 25 °C, I <sub>S</sub> = 5.4 A, V <sub>GS</sub> = 0 V <sup>b</sup>		-	-	2.0	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25 °C, I <sub>F</sub> = 10 A, dI/dt = 100 A/μs <sup>b</sup>		-	330	730	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			-	2.8	6.6	μC
Forward Turn-On Time	t <sub>on</sub>	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> and L <sub>D</sub> )					

**Notes**

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).

b. Pulse width ≤ 300 μs; duty cycle ≤ 2 %.

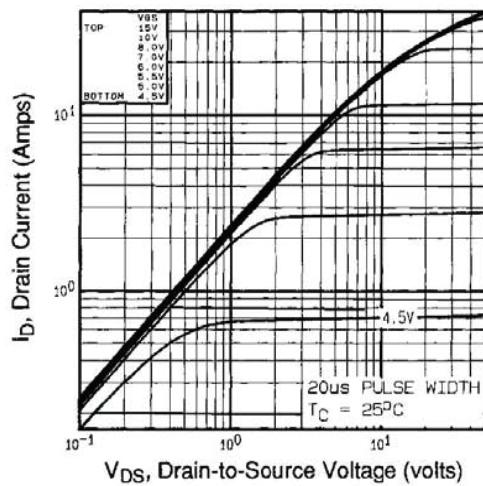
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted


Fig. 1 - Typical Output Characteristics,  $T_C = 25\text{ }^\circ\text{C}$

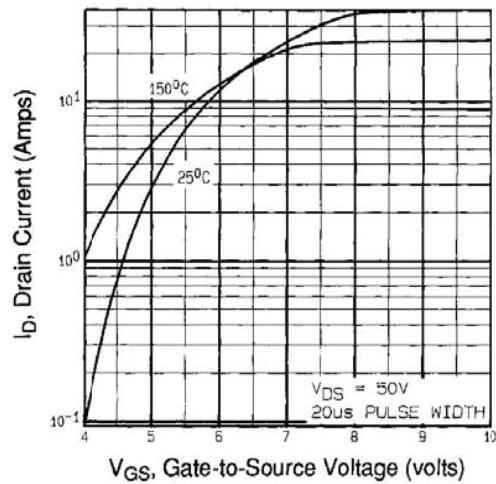


Fig. 3 - Typical Transfer Characteristics

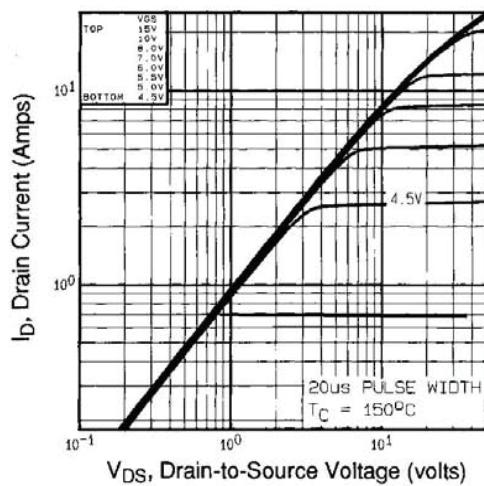


Fig. 2 - Typical Output Characteristics,  $T_C = 150\text{ }^\circ\text{C}$

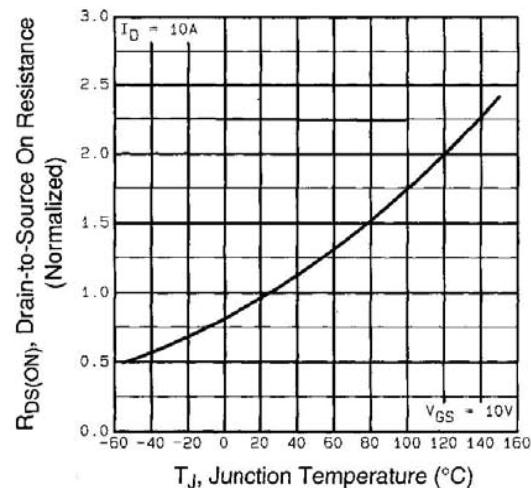


Fig. 4 - Normalized On-Resistance vs. Temperature

# IRFI740G, SiHFI740G

Vishay Siliconix

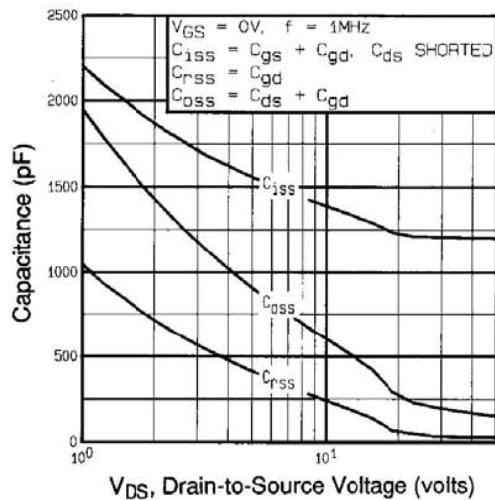


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

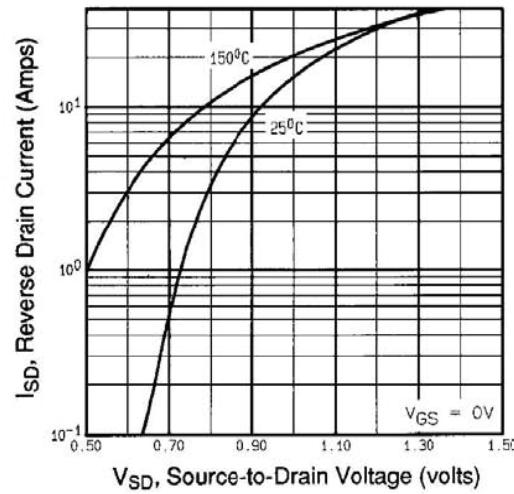


Fig. 7 - Typical Source-Drain Diode Forward Voltage

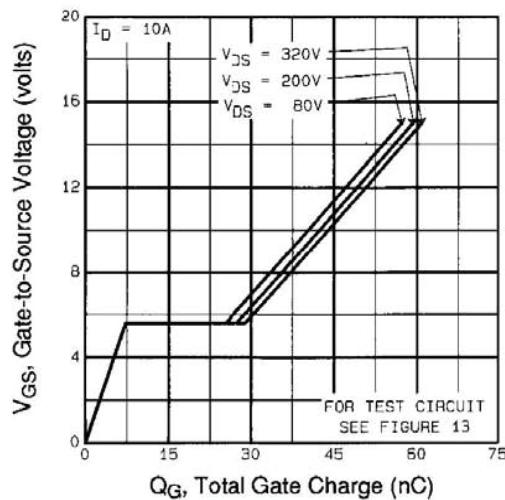


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

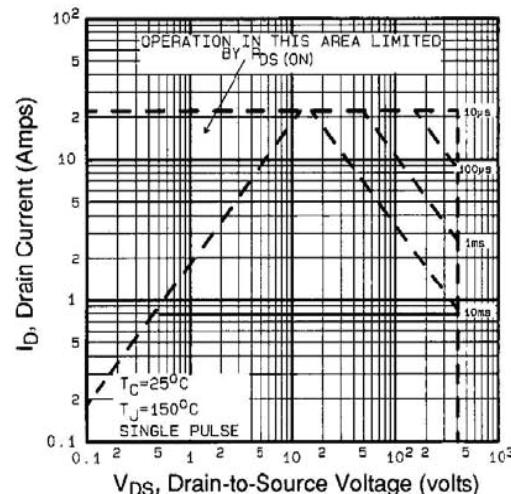


Fig. 8 - Maximum Safe Operating Area

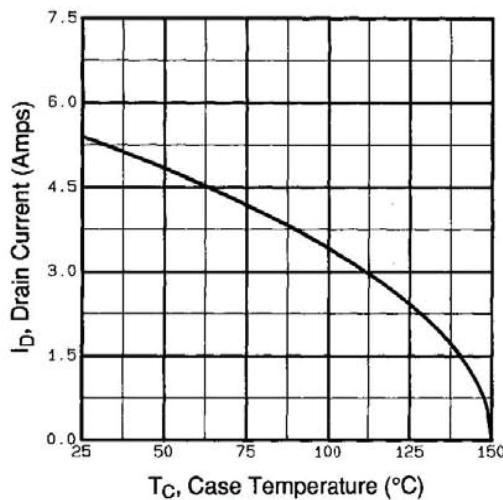


Fig. 9 - Maximum Drain Current vs. Case Temperature

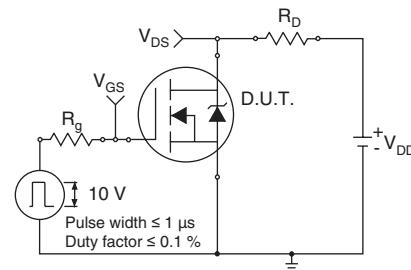


Fig. 10a - Switching Time Test Circuit

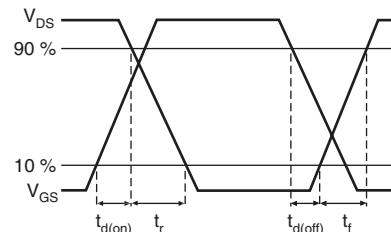


Fig. 10b - Switching Time Waveforms

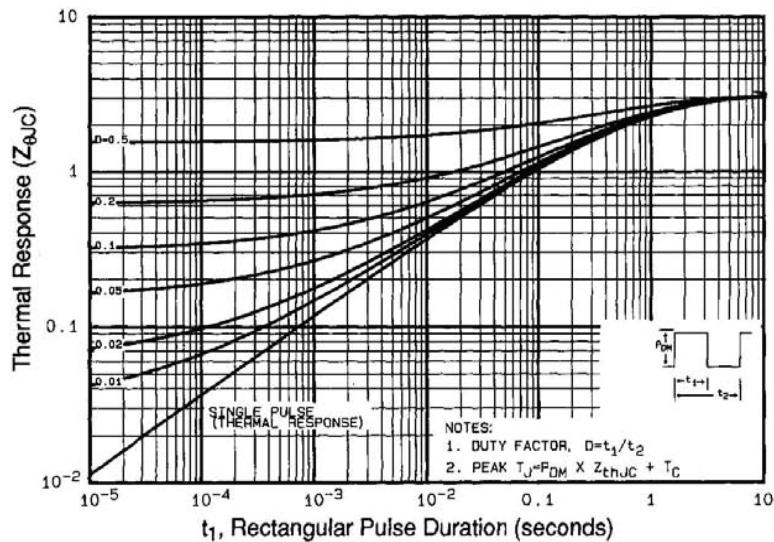


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

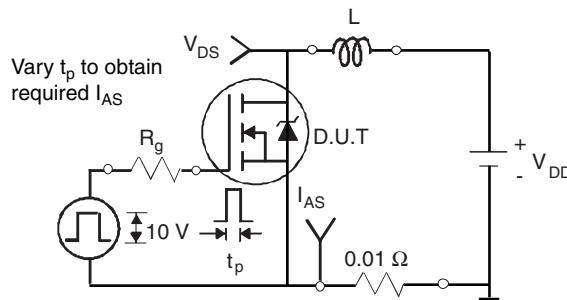


Fig. 12a - Unclamped Inductive Test Circuit

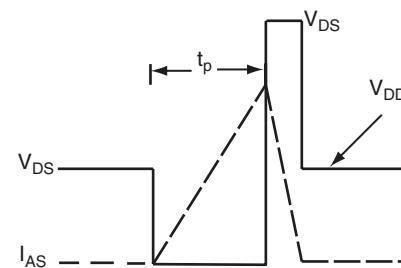


Fig. 12b - Unclamped Inductive Waveforms

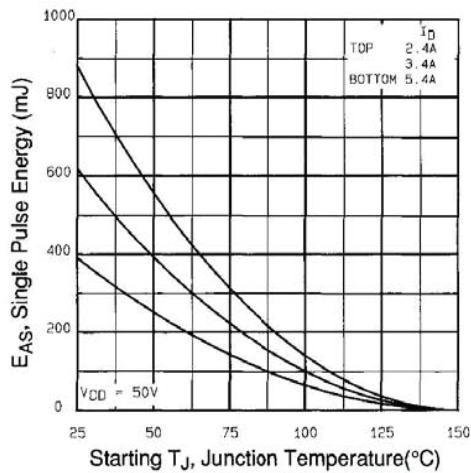


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

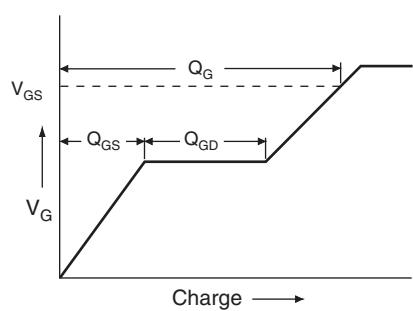


Fig. 13a - Basic Gate Charge Waveform

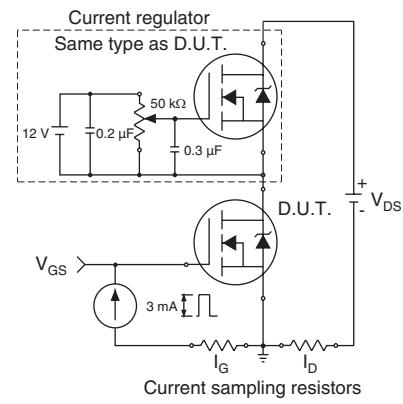
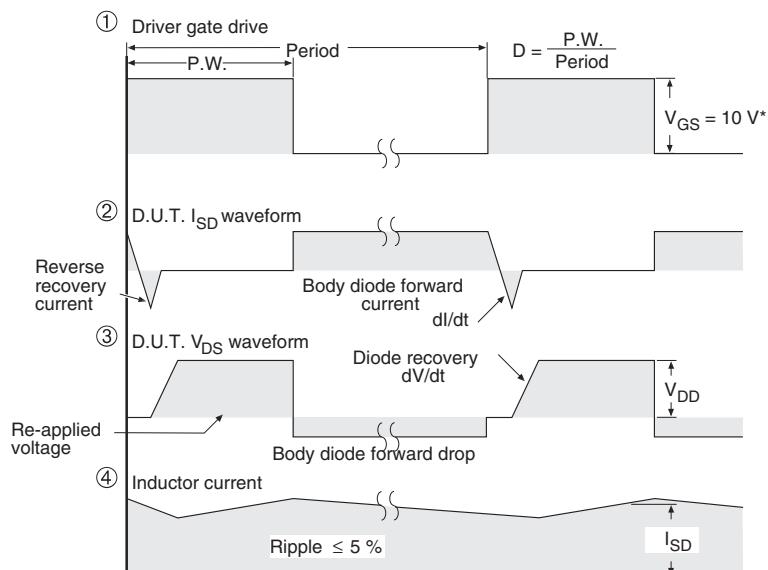
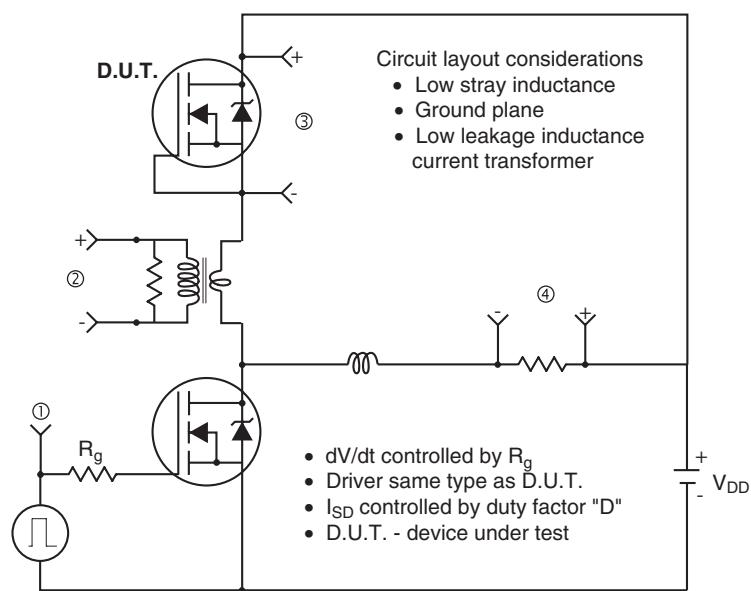


Fig. 13b - Gate Charge Test Circuit

### Peak Diode Recovery dV/dt Test Circuit



\*  $V_{GS} = 5 \text{ V}$  for logic level devices

**Fig. 14 - For N-Channel**

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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помошь в подборе аналогов, поставка прототипов;
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- 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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