Ordering number : ENA2204A

EFC6604R

N-Channel Power MOSFET
12V, 13A, 9.0mΩ, Dual EFCP

ON Semiconductor®

http://onsemi.com

Features

- 2.5V drive
- Common-drain type
- 2KV ESD HBM
- Protection diode in
- Halogen free compliance

Applications

- Lithium-ion battery charging and discharging switch

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Source to Source Voltage	V_{SSS}		12	V
Gate to Source Voltage	V_{GSS}		±12	V
Source Current (DC)	I_S		13	A
Source Current (Pulse)	I_{SP}	PW≤10μs, duty cycle≤1%	60	A
Total Dissipation	P_T	When mounted on ceramic substrate (5000mm^2×0.8mm)	1.6	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		- 55 to +150	°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.

Electrical Characteristics at Ta = 25°C

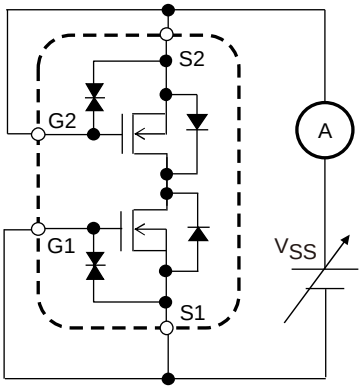
Parameter	Symbol	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Source to Source Breakdown Voltage	$V(BR)_{SSS}$	I_S=1mA, V_{GS}=0V	Test Circuit 1	12			V
Zero-Gate Voltage Source Current	I_{SSS}	V_{SS}=10V, V_{GS}=0V	Test Circuit 1			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{SS}=0V	Test Circuit 2			±1.0	μA
Cutoff Voltage	V_{GS}(off)	V_{SS}=6V, I_S=1mA	Test Circuit 3	0.5		1.3	V
Forward Transfer Admittance	| yfs |	V_{SS}=6V, I_S=3A	Test Circuit 4		13.7		S
Static Source to Source On-State Resistance	R_{SS}(on)1	I_S=3A, V_{GS}=4.5V	Test Circuit 5	6.0	7.5	9.0	mΩ
	R_{SS}(on)2	I_S=3A, V_{GS}=4.0V	Test Circuit 5	6.4	8.1	9.7	mΩ
	R_{SS}(on)3	I_S=3A, V_{GS}=3.8V	Test Circuit 5	6.7	8.4	10.0	mΩ
	R_{SS}(on)4	I_S=3A, V_{GS}=3.1V	Test Circuit 5	7.8	9.8	12.7	mΩ
	R_{SS}(on)5	I_S=3A, V_{GS}=2.5V	Test Circuit 5	10.0	12.6	17.7	mΩ
Turn-ON Delay Time	t_d(on)	V_{SS}=6V, V_{GS}=4.5V, I_S=3A	Test Circuit 6		300		ns
Rise Time	t_r				1200		ns
Turn-OFF Delay Time	t_d(off)				5200		ns
Fall Time	t_f				3900		ns
Total Gate Charge	Qg	V_{SS}=6V, V_{GS}=4.5V, I_S=13A	Test Circuit 7		29		nC
Forward Source to Source Voltage	$V_{F(S-S)}$	I_S=3A, V_{GS}=0V	Test Circuit 8		0.75	1.2	V

ORDERING INFORMATION

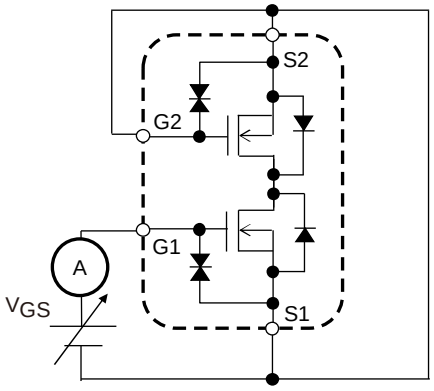
See detailed ordering and shipping information on page 5 of this data sheet.

Test circuits are example of measuring FET1 side

Test Circuit 1
I_{SSS}

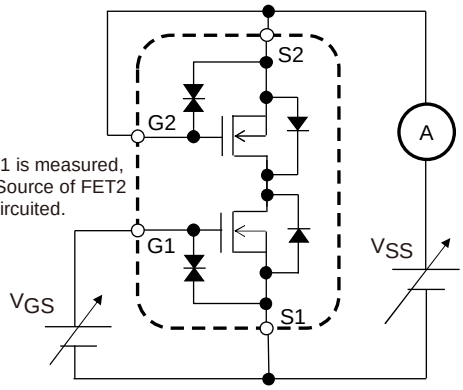


Test Circuit 2
I_{GSS}



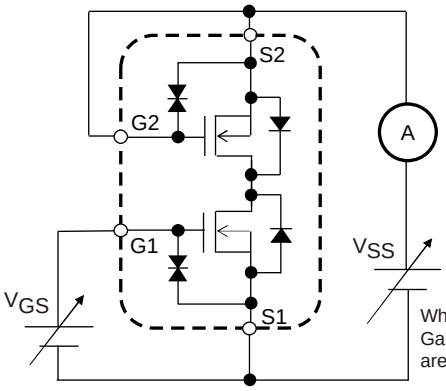
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 3
$V_{GS(off)}$



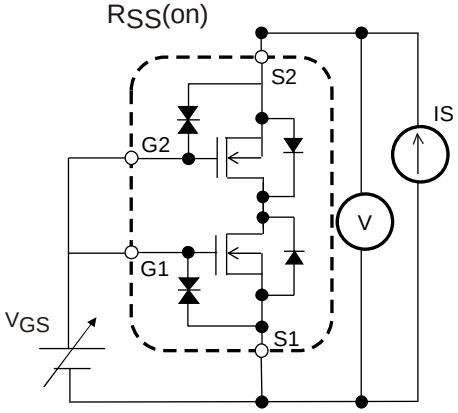
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4
| yfs |

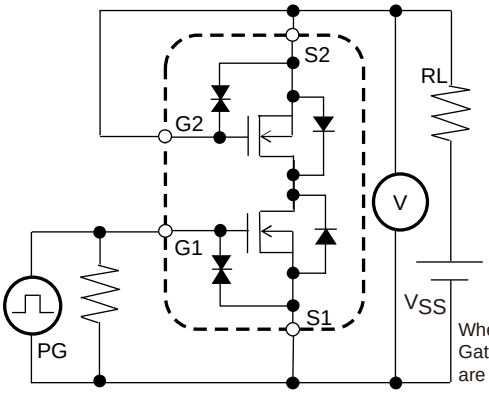


When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 5
$R_{SS(on)}$

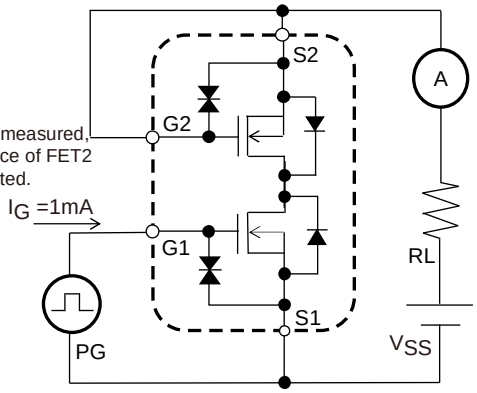


Test Circuit 6
$t_{d(on)}$, t_r, $t_{d(off)}$, t_f



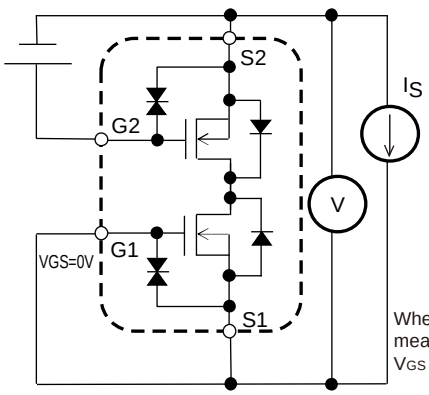
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 7
Qg

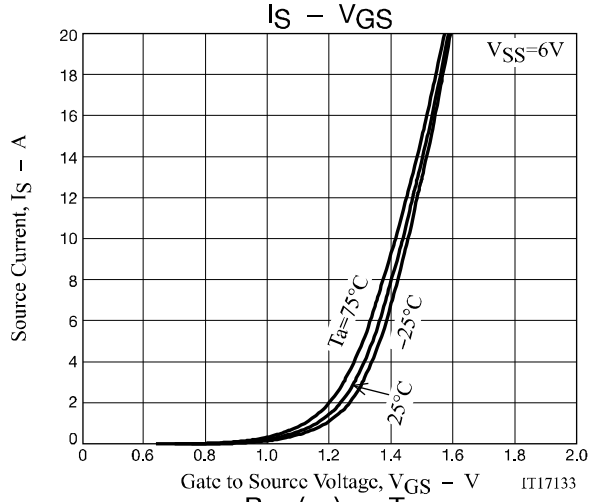


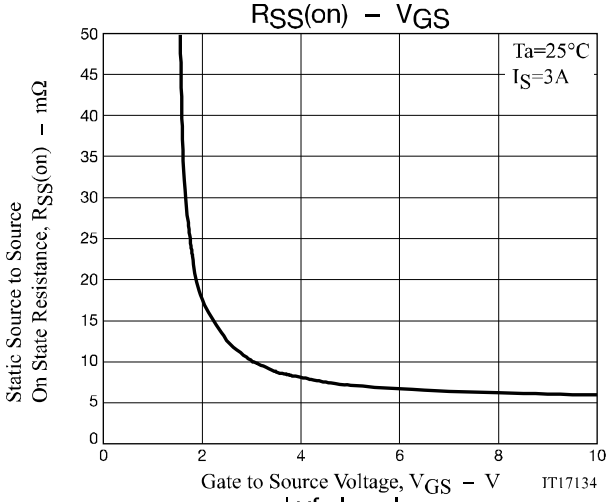
When FET1 is measured, Gate and Source of FET2 are short-circuited.

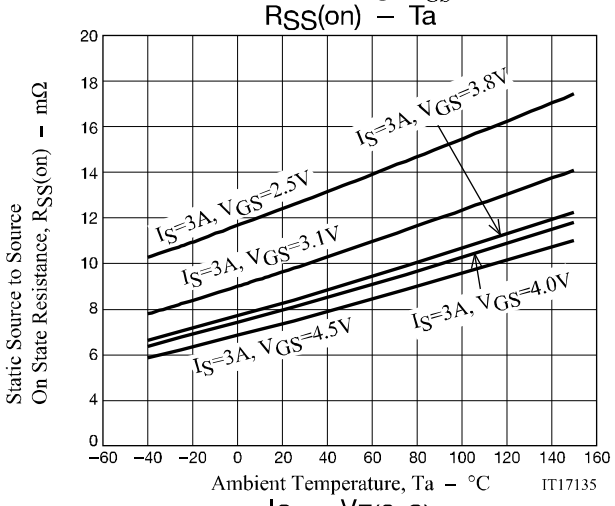
Test Circuit 8
$V_{F(S-S)}$

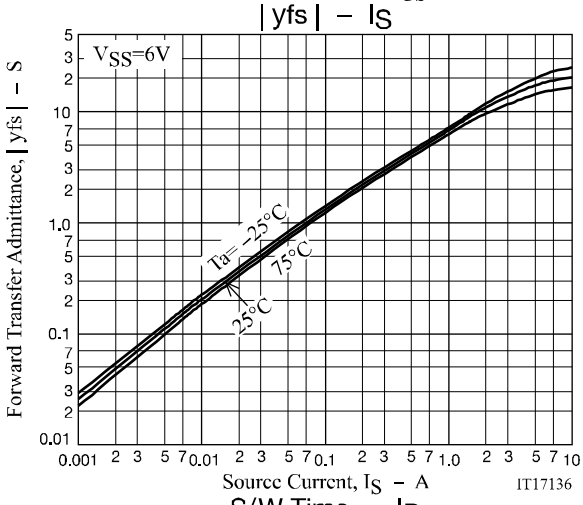


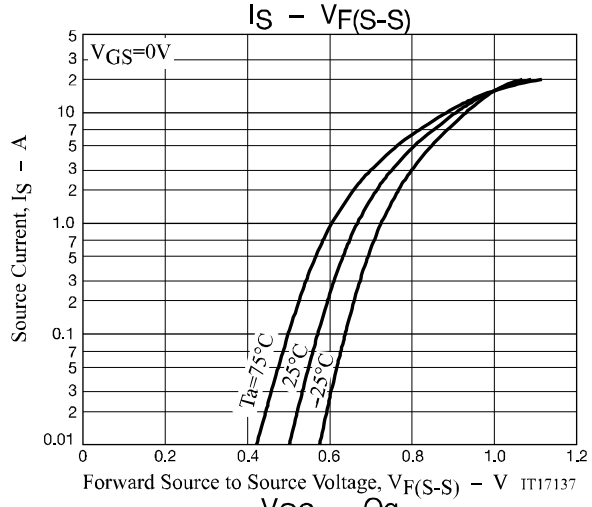
When FET1 is measured,+4.5V is added to V_{GS} of FET2.

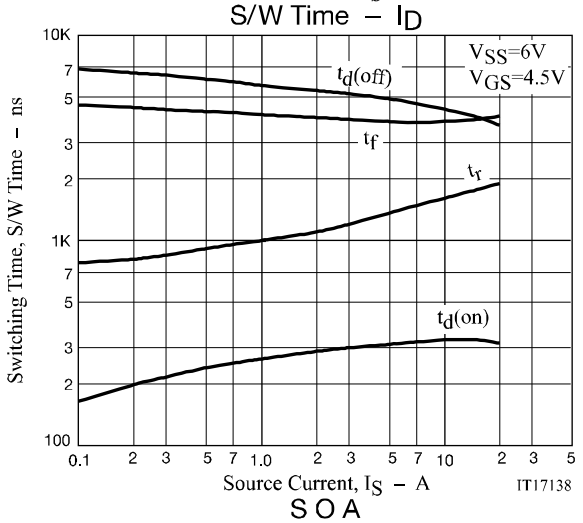

IS – VGS
VSS=6V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Gate to Source Voltage, VGS – V
IT17133

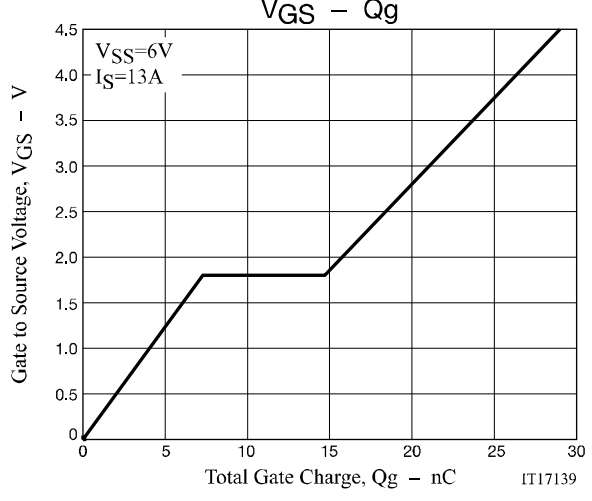

RSS(on) – VGS
Ta=25°C
IS=3A
Static Source to Source
On State Resistance, RSS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17134

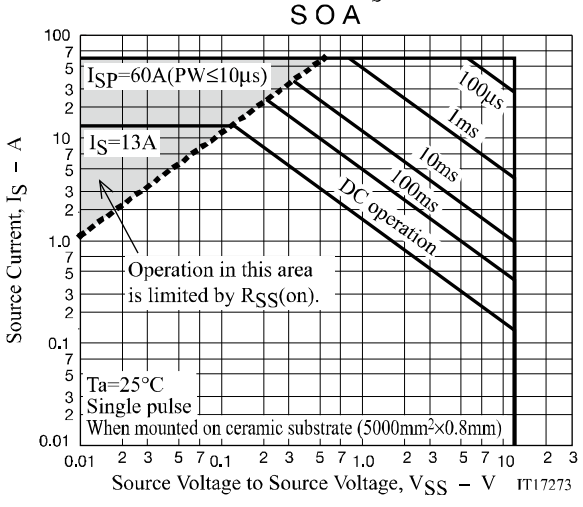

RSS(on) – Ta
IS=3A, VGS=3.8V
IS=3A, VGS=2.5V
IS=3A, VGS=3.1V
IS=3A, VGS=4.0V
IS=3A, VGS=4.5V
Static Source to Source
On State Resistance, RSS(on) – mΩ
Ambient Temperature, Ta – °C
IT17135

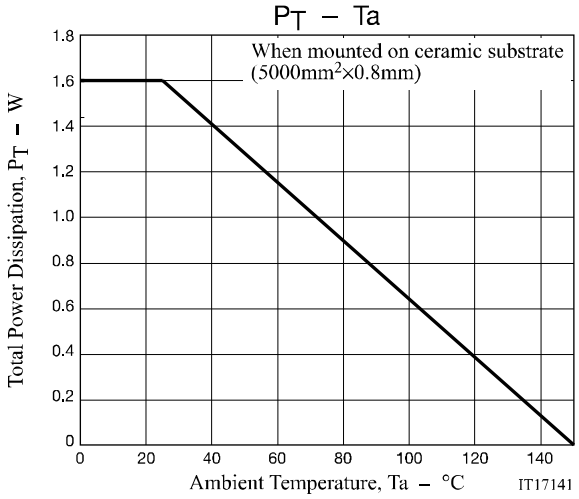

| yfs | – IS
VSS=6V
Ta= –25°C
25°C
75°C
Forward Transfer Admittance, | yfs | – S
Source Current, IS – A
IT17136


IS – VF(S-S)
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Source to Source Voltage, VF(S-S) – V
IT17137


S/W Time – ID
VSS=6V
VGS=4.5V
td(off)
tf
tr
td(on)
Switching Time, S/W Time – ns
Source Current, IS – A
IT17138


VGS – Qg
VSS=6V
IS=13A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17139


S O A
ISP=60A(PW≤10μs)
IS=13A
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RSS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (5000mm²×0.8mm)
Source Current, IS – A
Source Voltage to Source Voltage, VSS – V
IT17273


PT – Ta
When mounted on ceramic substrate
(5000mm2×0.8mm)
Total Power Dissipation, PT – W
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
120
140
Ambient Temperature, Ta – °C
IT17141

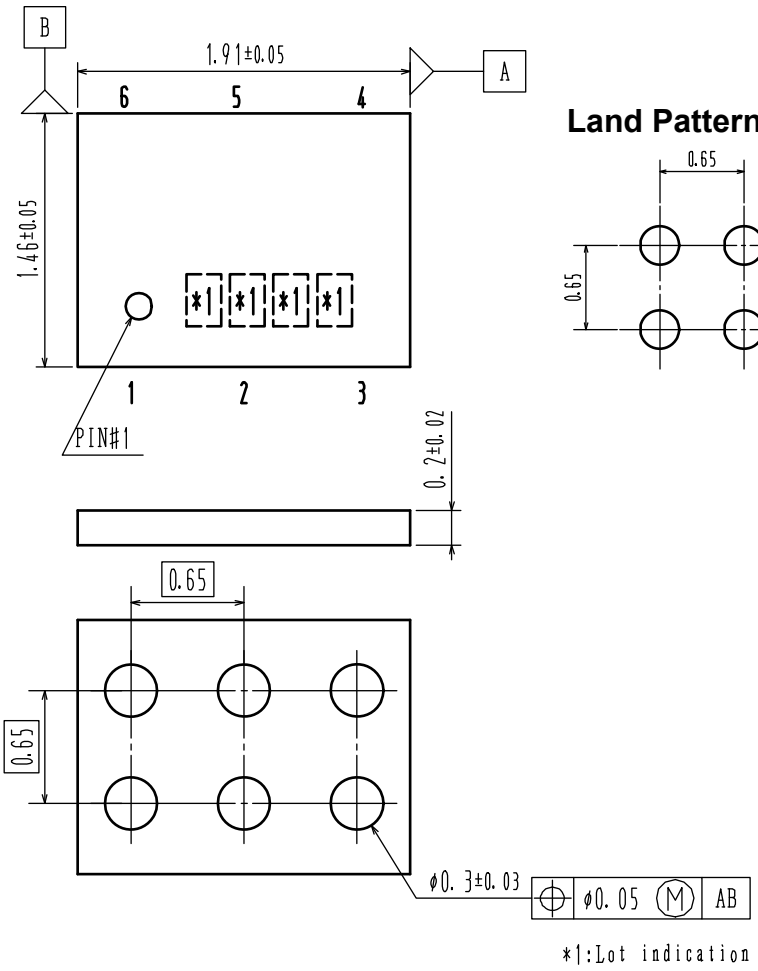
Package Dimensions

EFC6604R-TR

EFCP1915-6CE-020

Unit : mm

1: Source1
2: Gate1
3: Source1
4: Source2
5: Gate2
6: Source2

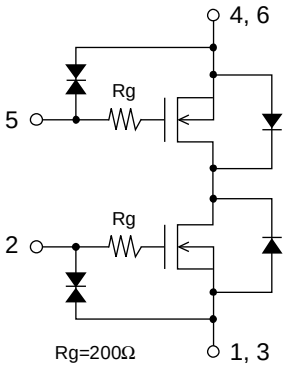


Land Pattern Example

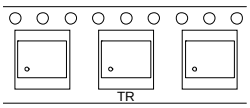
Ordering & Package Information

Device	Package	Shipping	note
EFC6604R-TR	EFCP	5,000 pcs. / reel	Pb-Free and Halogen Free

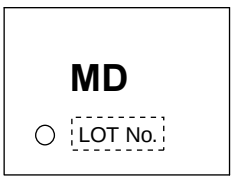
Electrical Connection



Packing Type: TR



Marking



Note on usage : Since the EFC6604R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

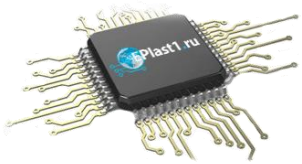
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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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