



## Complementary MOSFET

## 2NP12

## ■ N-Channel Mosfet Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage (Note.1)	V <sub>DSS</sub>	I <sub>D</sub> =100 μ A, V <sub>GS</sub> =0V	60			V
Zero Gate Voltage Drain Current (Note.1)	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μ A
Gate-Body Leakage Current (Note.1)	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±10	uA
Gate Threshold Voltage (Note.1)	V <sub>GS(th)</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA	1	1.6	2.5	V
Static Drain-Source On-Resistance (Note.1)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =500mA			2	Ω
		V <sub>GS</sub> =10V, I <sub>D</sub> =50mA			3	
Forward Transfer Admittance (Note.1)	Y <sub>fs</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =200mA	80			ms
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz			50	pF
Output Capacitance	C <sub>oss</sub>				25	
Reverse Transfer Capacitance	C <sub>rss</sub>				5	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =200mA			0.8	nC
Turn-On DelayTime	t <sub>d(on)</sub>	I <sub>D</sub> =200mA, V <sub>DS</sub> =30V, R <sub>G</sub> =10Ω, V <sub>GEN</sub> =10V, R <sub>L</sub> =150Ω			20	ns
Turn-Off DelayTime	t <sub>d(off)</sub>				40	

Note: 1. Short duration test pulse used to minimize self-heating effect.

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## ■ P-Channel Mosfet Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-50			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V			-0.1	μA
		V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-15	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-1.0mA	-0.8		-2	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-5V, I <sub>D</sub> =-100mA			5	Ω
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-25V, I <sub>D</sub> =-100mA, f=1.0KHz	50			mS
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-5V, f=1MHz		30		pF
Output Capacitance	C <sub>oss</sub>			10		
Reverse Transfer Capacitance	C <sub>rss</sub>			5		
Turn-On DelayTime	t <sub>d(on)</sub>		V <sub>DD</sub> =-15V, I <sub>D</sub> =-0.25A, R <sub>L</sub> =50Ω (Note 2)		2.5	
Turn-On Rise Time	t <sub>r</sub>			1		
Turn-Off DelayTime	t <sub>d(off)</sub>			16		
Turn-Off Fall Time	t <sub>f</sub>			8		
Gate Charge	Q <sub>T</sub>			6000		PC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-0.13	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				-0.52	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>SD</sub> =-130mA, V <sub>GS</sub> =0V		-2.5		V

Note2 . Switching Time is Essentially Independent of Operating Temperature.

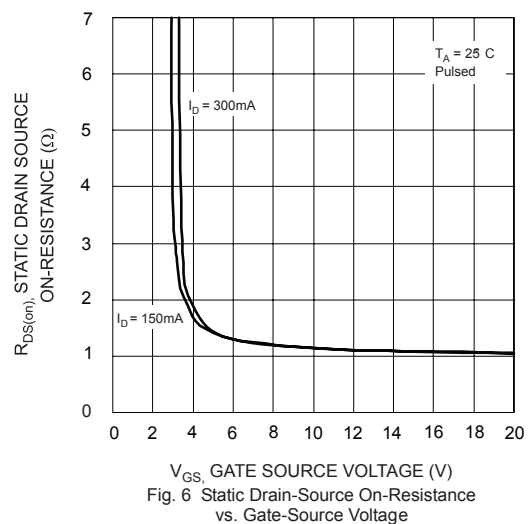
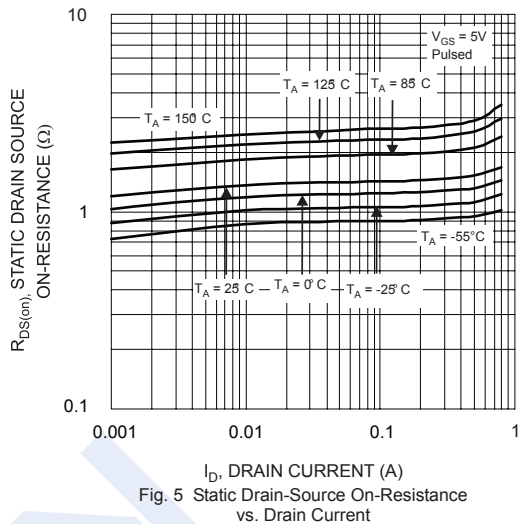
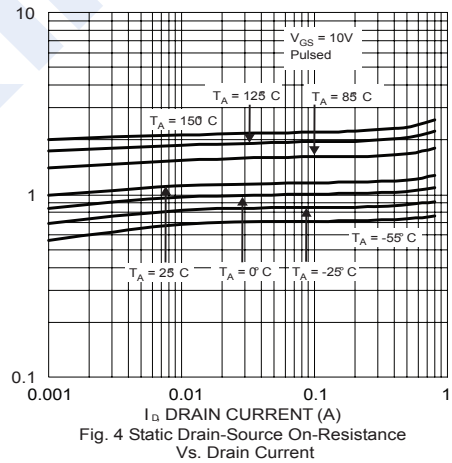
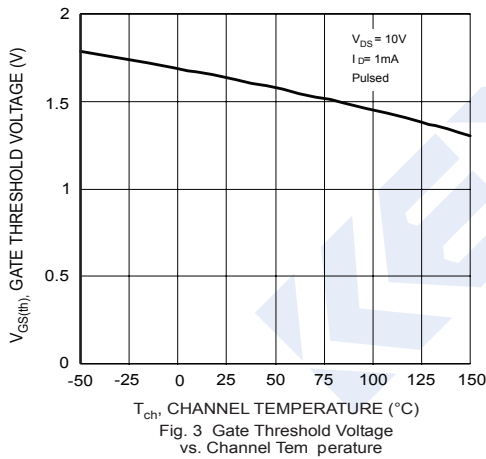
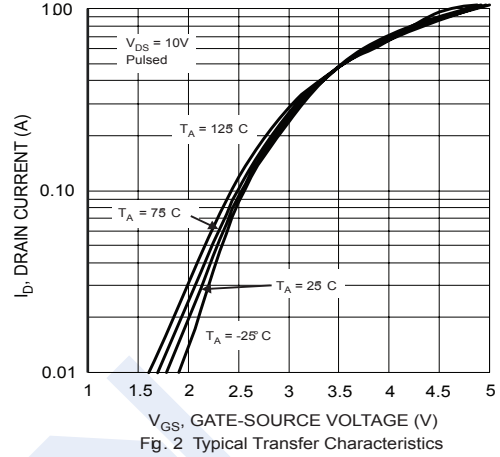
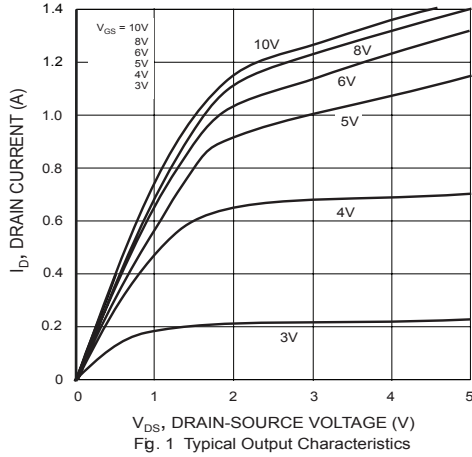
## ■ Marking

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■ N-Channel Mosfet Typical Characteristics



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### ■ N-Channel Mosfet Typical Characteristics

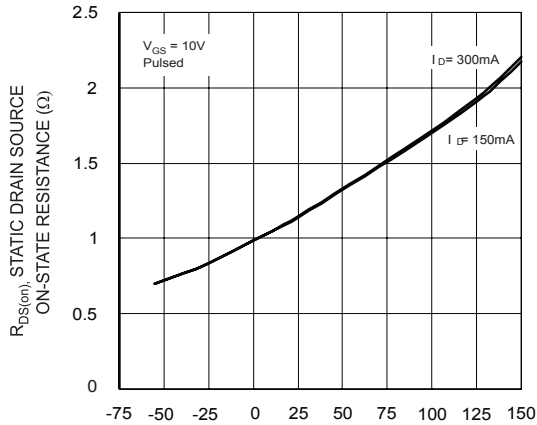


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

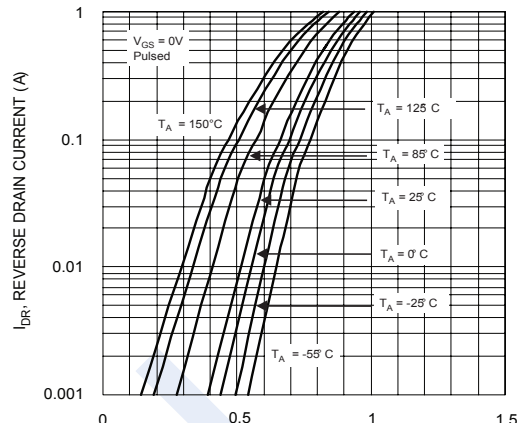


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

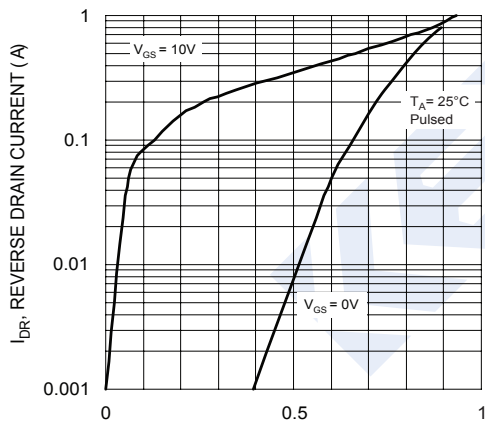


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

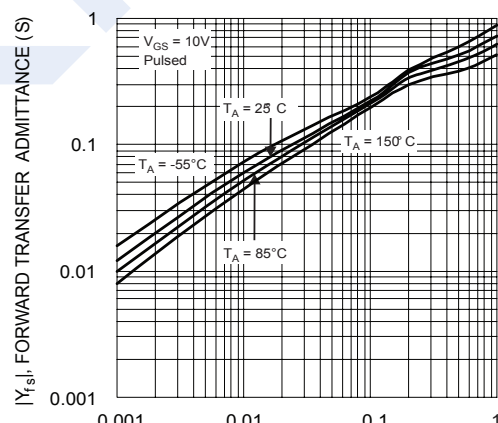


Fig. 10 Forward Transfer Admittance vs. Drain Current

## Complementary MOSFET 2NP12

■ P-Channel Mosfet Typical Characteristics

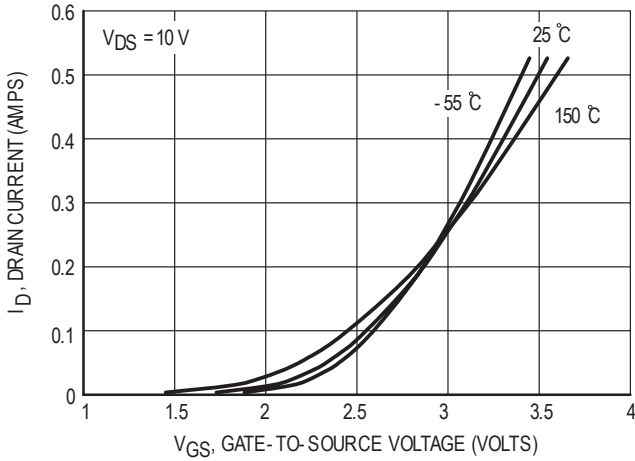


FIG1. Transfer Characteristics

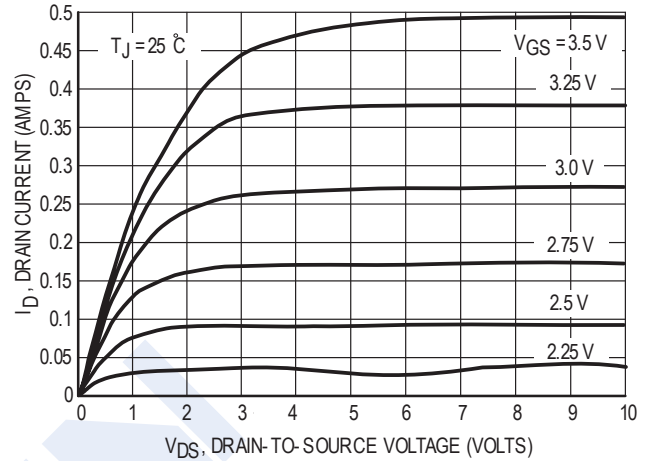


FIG2. On-Region Characteristics

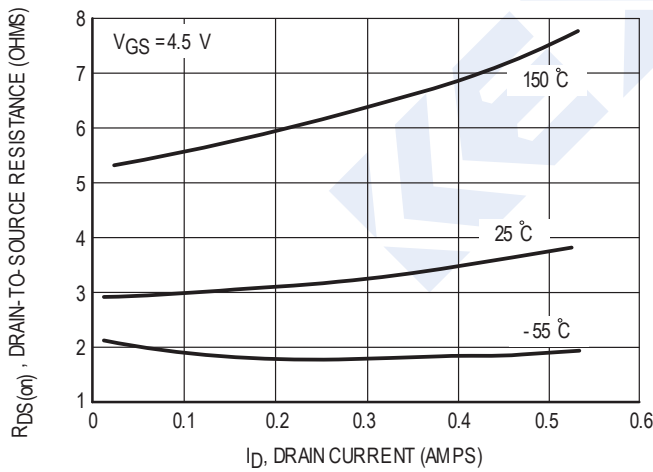


FIG3. On-Resistance versus Drain Current

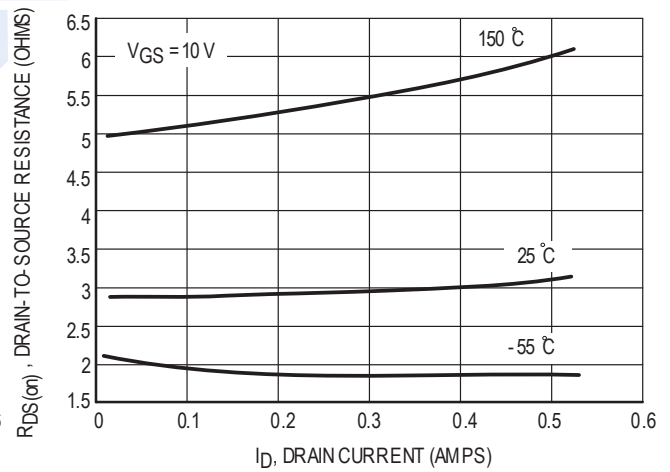


FIG4. On-Resistance versus Drain Current

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■ P-Channel Mosfet Typical Characteristics

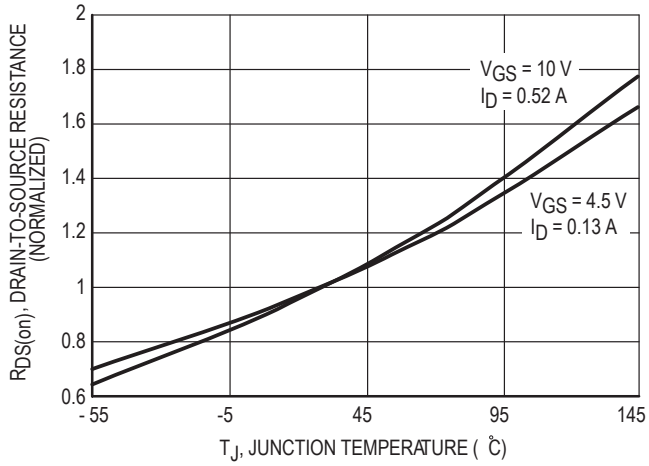


FIG5. On-Resistance Variation with Temperature

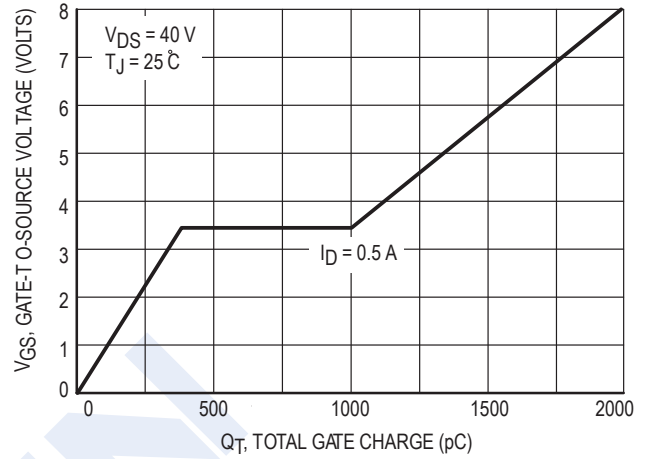


FIG6. Gate Charge

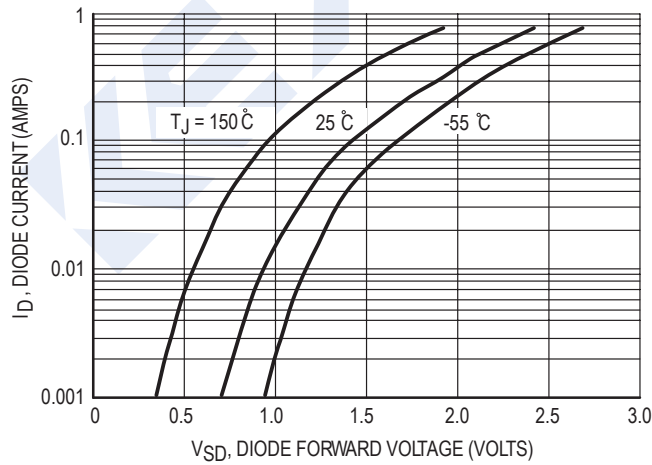


FIG7. Body Diode Forward Voltage