ND2406L/2410L, BSS129

N-Channel Depletion-Mode MOSFET Transistors

Product Summary

Part Number	$V_{(BR)DSV}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(off)}$ (V)	I_D (A)
ND2406L	240	6	–1.5 to –4.5	0.23
ND2410L		10	–0.5 to –2.5	0.18
BSS129	230	20	–0.7 (min)	0.15

Features

- High Breakdown Voltage: 260 V
- Normally "On" Low r_{DS} Switch: 3.5 Ω
- Low Input and Output Leakage
- Low-Power Drive Requirement
- Low Input Capacitance

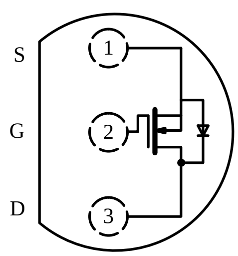
Benefits

- Full-Voltage Operation
- Low Offset Voltage
- Low Error Voltage
- Easily Driven Without Buffer
- High-Speed Switching

Applications

- Normally "On" Switching Circuits
- Current Sources/Limiters
- Power Supply, Converter Circuits
- Solid-State Relays
- Telecom Switches

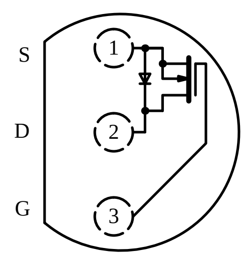
TO-226AA
(TO-92)



Top View

ND2406L
ND2410L

TO-92-18CD
(TO-18 Lead Form)



Top View

BSS129

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	ND2406L	ND2410L	BSS129	Unit
Drain-Source Voltage		V_{DS}	240	240	230	V
Gate-Source Voltage		V_{GS}	±30	±30	±20	
Continuous Drain Current (T_J = 150°C)	T_A= 25°C	I_D	0.23	0.18	0.15	A
	T_A= 100°C		0.14	0.12		
Pulsed Drain Current[a]		I_{DM}	0.9	0.9	0.6	
Power Dissipation	T_A= 25°C	P_D	0.8	0.8	1.0	W
	T_A= 100°C		0.32	0.32	0.4	
Maximum Junction-to-Ambient		R_{thJA}	156	156	125	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150			°C

Notes
a. Pulse width limited by maximum junction temperature.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70198. Applications information may also be obtained via FaxBack, request document #70612.

Specifications[a]

Parameter	Symbol	Test Conditions	Typ[b]	Limits ND2406L Min	Limits ND2406L Max	Limits ND2410L Min	Limits ND2410L Max	Limits BSS129 Min	Limits BSS129 Max	Unit
Static										
Drain-Source Breakdown Voltage	$V_{(BR)DSV}$	V_{GS} = –9 V, I_D = 10 µA	260	240						V
		V_{GS} = –5 V, I_D = 10 µA	260			240				V
		V_{GS} = –3 V, I_D = 250 µA	260					230		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 5 V, I_D = 10 µA		–1.5	–4.5	–0.5	–2.5			V
		V_{DS} = 3 V, I_D = 1 mA						–0.7		V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 10		± 10		± 100	nA
		T_J = 125°C			± 50		± 50			nA
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 180 V, V_{GS} = –9 V			1					µA
		T_J = 125°C			200					µA
		V_{DS} = 180 V, V_{GS} = –5 V					1			µA
		T_J = 125°C					200			µA
		V_{DS} = 230 V, V_{GS} = –3 V							0.1	µA
		T_J = 125°C							200	µA
Drain-Saturation Current[c]	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0 V	350	40		40				mA
Drain-Source On-Resistance[c]	$r_{DS(on)}$	V_{GS} = 2 V, I_D = 30 mA	3.3							Ω
		V_{GS} = 0 V, I_D = 30 mA	4.5		6		10			Ω
		T_J = 125°C	7.2		15		25			Ω
		V_{GS} = 0 V, I_D = 14 mA	4						20	Ω
Forward Transconductance[c]	g_{fs}	V_{DS} = 25 V, I_D = 250 mA	375					140		mS
		V_{DS} = 10 V, I_D = 30 A	110							mS
Common Source Output Conductance[c]	g_{os}	V_{DS} = 10 V, I_D = 30 A	70							µS
Dynamic										
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = –5 V, f = 1 MHz	70		120		120			pF
Output Capacitance	C_{oss}		20		30		30			pF
Reverse Transfer Capacitance	C_{rss}		10		15		15			pF
Switching[d]										
Turn-On Time	$t_{d(on)}$	V_{DD} = 25 V, R_L = 830 Ω, $I_D \cong$ 30 mA, V_{GEN} = −5 V, R_G = 25 Ω	15							ns
	t_r		75							ns
Turn-Off Time	$t_{d(off)}$		40							ns
	t_f		100							ns

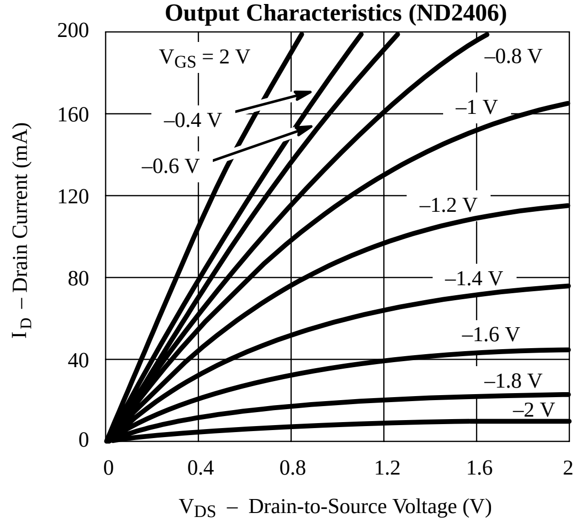
Notes

VDDV24

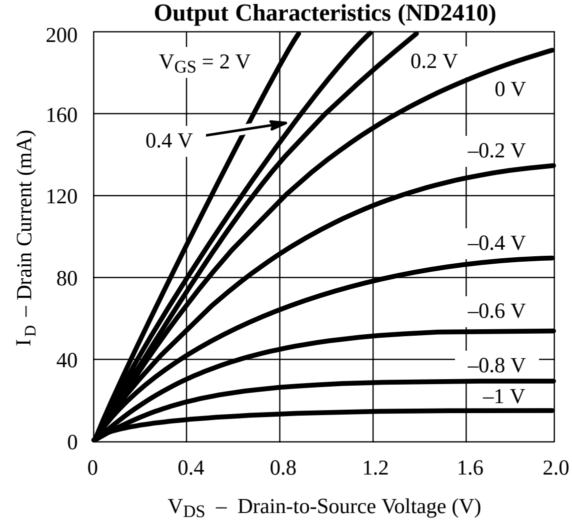
a. T_A = 25°C unless otherwise noted.
b. For DESIGN AID ONLY, not subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 2%.
d. Switching time is essentially independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

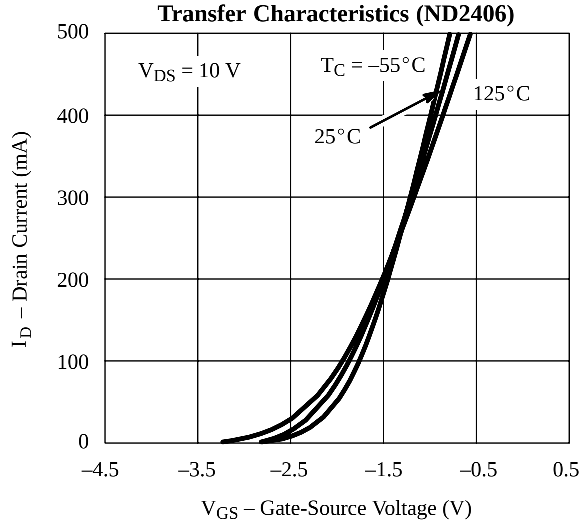
Output Characteristics (ND2406)



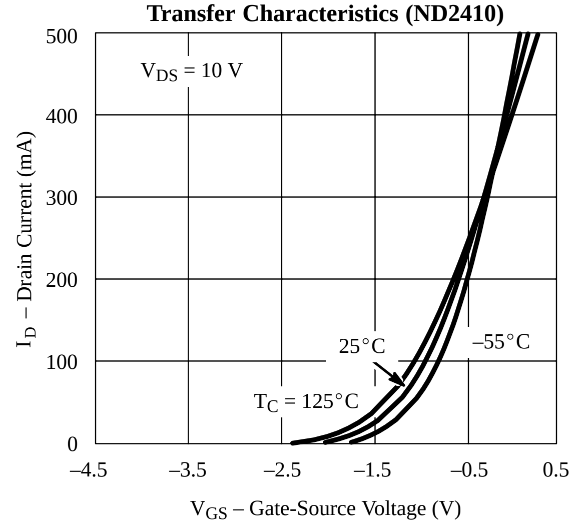
Output Characteristics (ND2410)



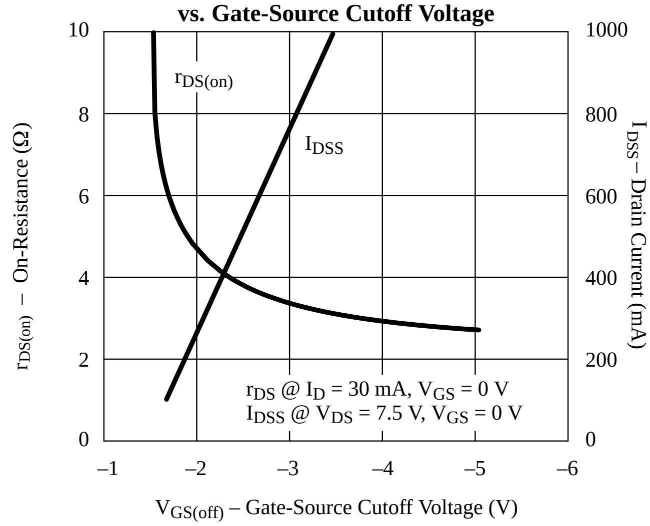
Transfer Characteristics (ND2406)



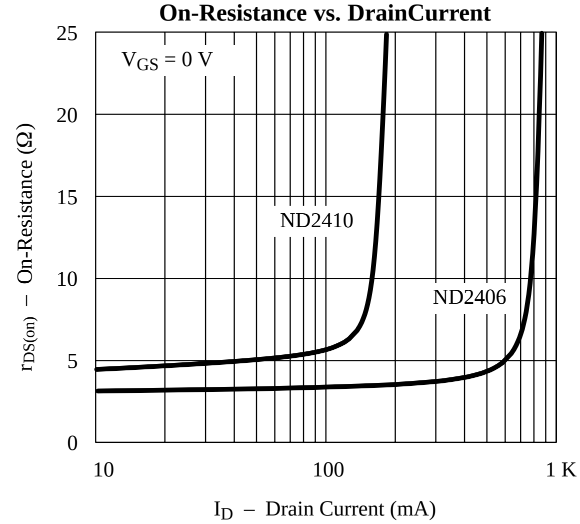
Transfer Characteristics (ND2410)



On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage

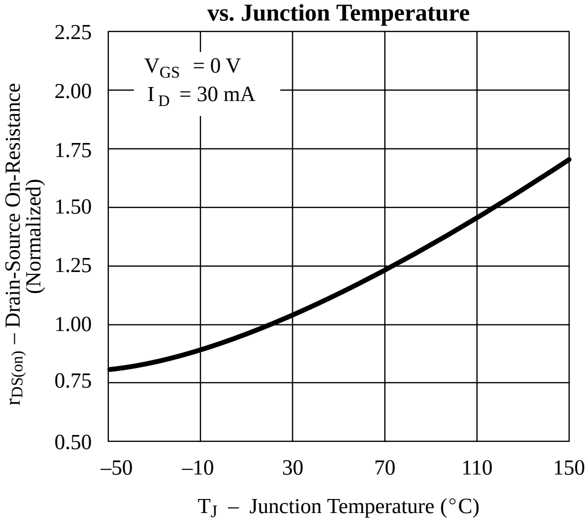


On-Resistance vs. DrainCurrent

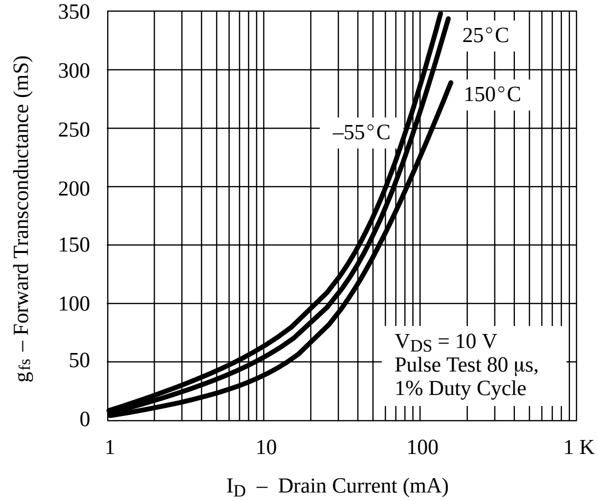


Typical Characteristics (25°C Unless Otherwise Noted) (Cont'd)

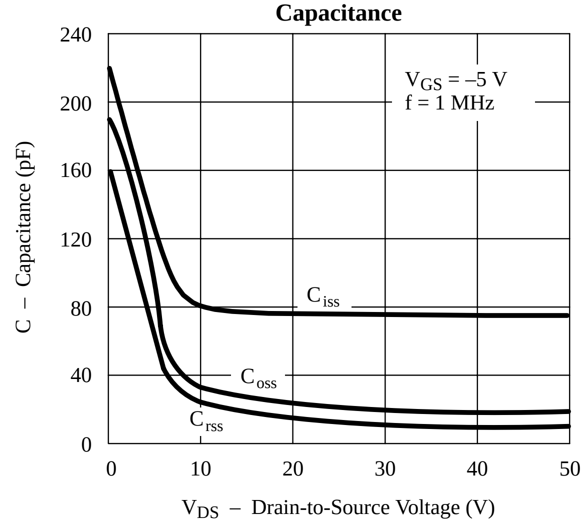
Normalized On-Resistance vs. Junction Temperature



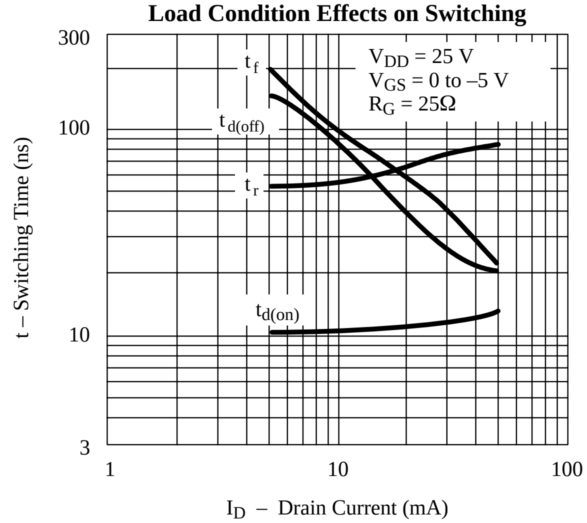
Forward Transconductance vs. Drain Current



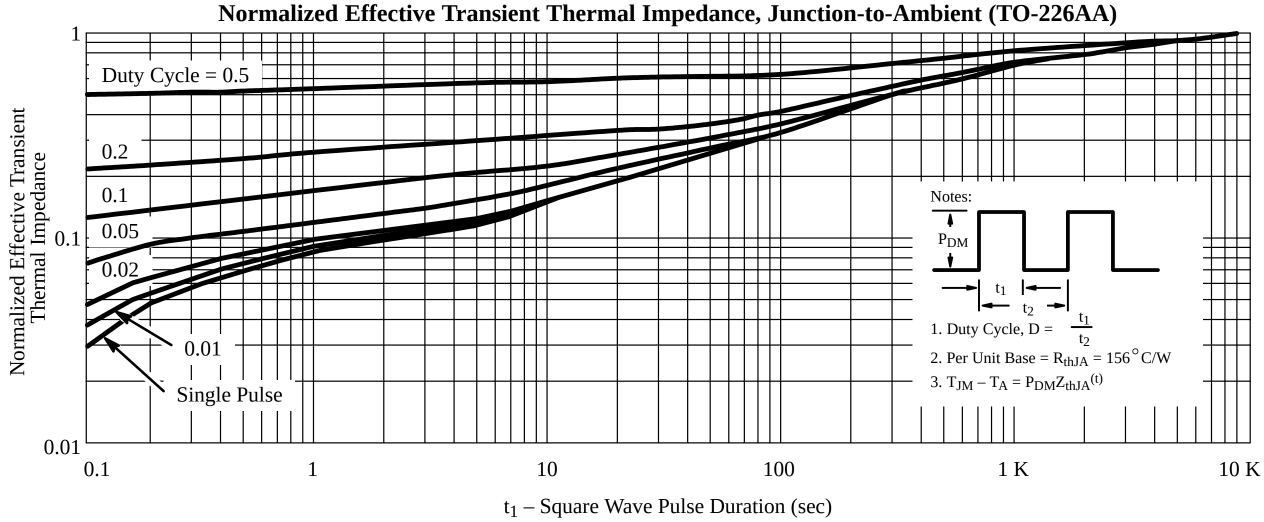
Capacitance



Load Condition Effects on Switching



Normalized Effective Transient Thermal Impedance, Junction-to-Ambient (TO-226AA)



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