ND2012 SERIES

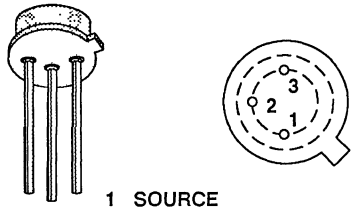
Siliconix incorporated

N-Channel Depletion-Mode MOS Transistors

TO-92 BOTTOM VIEW

1 SOURCE
2 GATE
3 DRAIN

TO-206AC (TO-52) BOTTOM VIEW



1 SOURCE
2 GATE
3 DRAIN & CASE

PRODUCT SUMMARY

PART NUMBER	$V_{(BR)DSV}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
ND2012L	200	12	0.16	TO-92
ND2012E	200	12	0.22	TO-206AC

Performance Curves: **VDDQ20** (See Section 7)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	ND2012L	ND2012E[2]	UNITS
Drain-Source Voltage		V_{DS}	200	200	V
Gate-Source Voltage		V_{GS}	±30	±20	V
Continuous Drain Current	T_A = 25°C	I_D	0.16	0.22	A
	T_A = 100°C		0.10	0.14	A
Pulsed Drain Current[1]		I_{DM}	0.8	0.8	A
Power Dissipation	T_A = 25°C	P_D	0.80	1.5	W
	T_A = 100°C		0.32	0.60	W
Operating Junction and Storage Temperature		T_j, T_{stg}	−55 to 150		°C
Lead Temperature (1/16" from case for 10 seconds)		T_L	300		°C

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	ND2012L	ND2012E	UNITS
Junction-to-Ambient	R_{thJA}	156	400	°C/W

[1]Pulse width limited by maximum junction temperature
[2]Reference case for all temperature testing

ELECTRICAL CHARACTERISTICS[1]			LIMITS			
				ND2012		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP[2]	MIN	MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSV}$	V_{GS} = -8 V, I_D = 10 µA	220	200		V
Gate-Source Cutoff Voltage	$V_{GS(OFF)}$	V_{DS} = 5 V, I_D = 10 µA	-3	-1.5	-4	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V	±0.1		±10	nA
		T_J = 125°C	±5		±50	nA
Drain Cutoff Current	$I_{D(OFF)}$	V_{DS} = 160 V, V_{GS} = -8 V	0.2		1	µA
		T_J = 125°C	5		200	µA
Drain Saturation Current[3]	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0 V	400	30		mA
Drain-Source On-Resistance[3]	$r_{DS(ON)}$	V_{GS} = 2 V, I_D = 20 mA	7			Ω
		V_{GS} = 0 V, I_D = 20 mA	8		12	Ω
		T_J = 125°C	15		30	Ω
Forward Transconductance	g_{FS}	V_{DS} = 7.5 V, I_D = 20 mA	55			mS
Common Source Output Conductance[3]	g_{OS}		75			µS
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = -5 V, f = 1 MHz	35		100	pF
Output Capacitance	C_{oss}		10		20	pF
Reverse Transfer Capacitance	C_{rss}		2		5	pF
SWITCHING						
Turn-On Time	$t_{d(ON)}$	V_{DD} = 25 V, R_L = 1250 Ω, I_D = 20 mA, V_{GEN} = -5 V, R_G = 25 Ω (Switching time is essentially independent of operating temperature)	20			ns
	t_r		20			ns
Turn-Off Time	$t_{d(OFF)}$		10			ns
	t_f		10			ns

NOTES: 1. T_A = 25 °C unless otherwise noted, T_C = 25 °C for ND2012E.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 300 µs, duty cycle ≤ 2%.

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