calogic CORPORATION

N-Channel Enhancement-Mode MOS Transistor

2N7002

DESCRIPTION

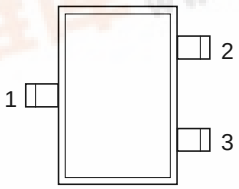
Calogic's 2N7002 device type is a vertical DMOS FET transistor housed in a surface mount SOT-23 for micro-assembly applications. The device is an excellent choice for switching applications where breakdown (B_V) and low on-resistance are important.

ORDERING INFORMATION

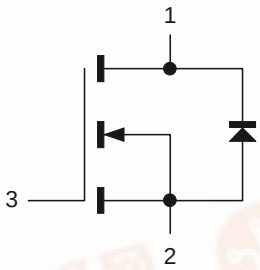
Part	Package	Temperature Range
2N7002	Plastic SOT-23 Package	-55°C to +150°C
X2N7002	Sorted Chips in Carriers	-55°C to +150°C

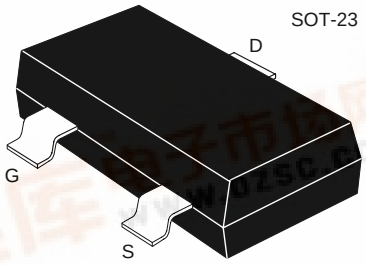
PIN CONFIGURATION

1 DRAIN
2 SOURCE
3 GATE



TOP VIEW





CD5

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)
60	7.5	0.115

PRODUCT MARKING	
2N7002	V02

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

SYMBOL	PARAMETERS	LIMITS	UNITS	TEST CONDITIONS
V_{DS}	Drain-Source Voltage	60	V	
V_{GS}	Gate-Source Voltage	±40		
I_D	Continuous Drain Current	0.115	A	T_A = 25°C
		0.073		T_A = 100°C
I_{DM}	Pulsed Drain Current[1]	0.8		
P_D	Power Dissipation	200	mW	T_A = 25°C
		80		T_A = 100°C
T_J	Operating Junction Temperature Range	-55 to 150	°C	
T_{stg}	Storage Temperature Range	-55 to 150		
T_L	Lead Temperature (1/16" from case for 10 sec.)	300		

THERMAL RESISTANCE RATINGS

SYMBOL	THERMAL RESISTANCE	LIMITS	UNITS
R_{thJA}	Junction-to-Ambient	625	K/W

NOTE: 1. Pulse width limited by maximum junction temperature.

SPECIFICATIONS[1]

SYMBOL	PARAMETER	MIN	TYP[2]	MAX	UNIT	TEST CONDITIONS
STATIC						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	60	70		V	I_D = 10µA, V_{GS} = 0V
$V_{GS(th)}$	Gate-Threshold Voltage	1	1.9	2.5		V_{DS} = V_{GS}, I_D = 0.25mA
I_{GSS}	Gate-Body Leakage			±100	nA	V_{GS} = ±20V, V_{DS} = 0V
I_{DSS}	Zero Gate Voltage Drain Current			1	µA	V_{DS} = 60V, V_{GS} = 0V
				500		T_C = 125°C
$I_{D(ON)}$	On-State Drain Current[3]	500	1000		mA	V_{DS} = ≥2$V_{DS(ON)}$, V_{GS} = 10V
$r_{DS(ON)}$	Drain-Source On-Resistance[3]		5	7.5	Ω	V_{GS} = 5V, I_D = 50mA
			9	13.5		T_C = 125°C
			2.5	7.5		V_{GS} = 10V, I_D = 0.5A
			4.4	13.5		T_C = 125°C
$V_{DS(ON)}$	Drain-Source On-Voltage[3]		0.25	0.375	V	V_{GS} = 5V, I_D = 50mA
			1.25	3.75		V_{GS} = 10V, I_D = 0.5A
			2.2	6.75		T_C = 125°C[4]
g_{FS}	Forward Transconductance[3]	80	170		mS	V_{DS} = 10V, I_D = 0.2A
g_{OS}	Common Source Output Conductance[3, 4]		500		µS	V_{DS} = 5V, I_D = 50mA
DYNAMIC						
C_{iss}	Input Capacitance		16	50	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz
C_{oss}	Output Capacitance[4]		11	25		
C_{rss}	Reverse Transfer Capacitance		2	5		
SWITCHING						
t_{ON}	Turn-On Time		7	20	nS	V_{DD} = 30V, R_L = 150Ω, I_D = 0.2A V_{GEN} = 10V, R_G = 25Ω (Switching time is essentially independent of operating temperature)
t_{OFF}	Turn-Off Time		7	20		

NOTES: 1. T_A = 25°C unless otherwise specified.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = ≤80µS, duty cycle ≤1%.
4. This parameter not registered with JEDEC.