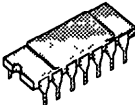
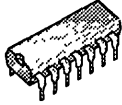


N-CHANNEL

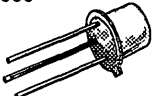
PART #	$V_{(BR)DS}$ (V)	$r_{DS(ON)}$ (Ω)	$V_{GS(th)}$ (V)	t_{ON} (ns)	C_{iss} (pF)	I_D (mA)	PD
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14-PIN CERAMIC (P) & PLASTIC (J)



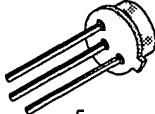
VQ1001J	30	1	2.5	30	38	0.85	2
VQ1001P	30	1	2.5	30	38	0.85	2
VQ1004P	60	3.5	2.5	10	35	0.46	2
VQ1004J	60	3.5	2.5	10	35	0.46	2
VQ1000J	60	5.5	2.5	10	16	0.23	2
VQ1000P	60	5.5	2.5	10	16	0.23	2
VQ1006P	90	4.5	2.5	10	35	0.40	2
VQ1006J	90	4.5	2.5	10	35	0.40	2

SOT-23


VN0603T	60	4	3.0	15	16	0.22	0.36
VN0605T	60	5	3.0	20	16	0.18	0.36
2N7002	60	8	2.5	20	16	0.12	0.2
2N7001	240	45	2.5	30	15	0.05	0.2
VN45350T	450	350	4.5	25	5	0.02	0.35
VN50300T	500	300	4.5	20	5	0.02	0.35

TO-205AD (TO-39)


VN0300B	30	1.2	2.5	30	38	1.51	5
2N6659	35	1.8	2.0	10	38	1.40	6.25
2N6660JANTX	60	3	2.0	10	30	0.99	6.25
2N6660	60	3	2.0	10	38	1.10	6.25
VN67AB	60	3.5	2.5	15	35	0.79	5
2N6661JANTX	90	4	2.0	10	30	0.86	6.25
2N6661	90	4	2.0	10	35	0.90	6.25
VN90AB	90	5	2.0	10	35	0.67	5
VN1206B	120	6	2.0	16	35	0.22	5
VN1706B	170	6	2.0	16	105	0.63	6.25
VN2406B	240	6	2.0	16	110	0.63	6.25
VN4012B	400	12	1.8	40	80	0.42	0.8

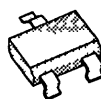
TO-206AC (TO-52)


VN10LE	60	5	2.5	10	16	0.38	1.5
VN10KE	60	5	2.5	10	38	0.17	0.3

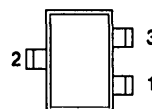
PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
60	7.5	0.115	SOT-23

SOT-23



TOP VIEW



1 GATE
2 DRAIN
3 SOURCE

Performance Curves VNDS06 (See Section 7)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	2N7002	UNITS
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 40	
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	± 0.115	A
	$T_C = 100^\circ\text{C}$		± 0.073	
Pulsed Drain Current ¹		I_{DM}	0.8	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	200	mW
	$T_C = 100^\circ\text{C}$		80	
Operating Junction Temperature		T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature		T_{stg}	-55 to 150	
Lead Temperature (1/16" from case for 10 seconds)		T_L	300	

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	2N7002	UNITS
Junction-to-Ambient	R_{thJA}	625	$^\circ\text{C/W}$

¹Pulse width limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS ¹				LIMITS			
PARAMETER	SYMBOL	TEST CONDITIONS	TYP ²	2N7002		UNIT	
				MIN	MAX		
STATIC							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	70	60		V	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 0.25 mA	2.15	1	2.5		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V V _{GS} = ±20 V T _C = 125°C	± 1 ± 5		±100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V V _{DS} = 60 V T _C = 125°C	0.02 1		1 500	μA	
On-State Drain Current ³	I _{D(ON)}	V _{DS} ≥ 2 V _{DS(ON)} , V _{GS} = 10 V	1000	500		mA	
Drain-Source On-Resistance ³	r _{DS(ON)}	V _{GS} = 5 V I _D = 50 mA T _C = 125°C	5 9		7.5 13.5	Ω	
		V _{GS} = 10 V I _D = 0.5 A T _C = 125°C	2.5 4.4		7.5 13.5		
		V _{GS} = 5 V, I _D = 50 mA	0.25		0.375		V
		V _{GS} = 10 V I _D = 0.5 A ⁴ T _C = 125°C	1.25 2.2		3.75 6.75		
Drain-Source On-Voltage ³	V _{DS(ON)}						
Forward Transconductance ³	g _{fs}	V _{DS} = 10 V, I _D = 0.2 A f = 1 kHz	170	80		mS	
Common Source Output Conductance ^{3,4}	g _{OS}	V _{DS} = 5 V, I _D = 50 mA	500			μS	
DYNAMIC							
Input Capacitance	C _{iss}	V _{DS} = 25 V V _{GS} = 0 V f = 1 MHz	16		50	pF	
Output Capacitance	C _{oss}		11		25		
Reverse Transfer Capacitance	C _{rss}		2		5		
SWITCHING							
Turn-On Time	t _{ON}	V _{DD} = 30 V, R _L = 150 Ω I _D = 0.2 A, V _{GEN} = 10 V R _G = 25 Ω	7		20	ns	
Turn-Off Time	t _{OFF}	(Switching time is essentially independent of operating temperature)	7		20		

- NOTES
- ¹ $T_C = 25^\circ\text{C}$ unless otherwise noted
 - ² For design aid only, not subject to production testing
 - ³ Pulse test, $PW = 80\text{ }\mu\text{s}$, duty cycle $\leq 1\%$
 - ⁴ This parameter not registered with JEDEC

N-Channel Enhancement-Mode MOSFET

DESIGNED FOR:

Switching
Amplification

FEATURES

- Low $r_{DS(on)} < 10 \Omega$
- Low Cost
- Surface Mount Package SOT-23

TYPE	PACKAGE	DEVICE
Single	TO-206AC	• VN10LE
	TO-92	• 2N7000, 2N7008 VN0603L, VN0610LL VN2222LL
	TO-237	• VN2222LM
	SOT-23	• VN0603T, VN0605T 2N7002
Quad	14-Pin Plastic	• VQ1000J
	14-Pin Dual-In-Line	• VQ1000P
	Chip	• Available as above specifications

GEOMETRY DIAGRAM

