2N7000G

Small Signal MOSFET
200 mAmps, 60 Volts
N−Channel TO−92

Features

- AEC Qualified
- PPAP Capable
- This is a Pb−Free Device*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain Source Voltage	V_{DSS}	60	Vdc
Drain−Gate Voltage (R_{GS} = 1.0 MΩ)	V_{DGR}	60	Vdc

Gate−Source Voltage
  – Continuous
  – Non−repetitive ($t_p \leq 50$ μs)
	V_{GS}
	V_{GSM}
		±20
		±40
			Vdc
			Vpk

Drain Current
  – Continuous
  – Pulsed
	I_D
	I_{DM}
		200
		500
			mAdc

Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	350 2.8	mW mW/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	357	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/16″ from case for 10 seconds	T_L	300	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.
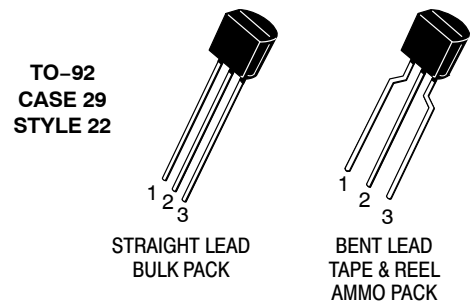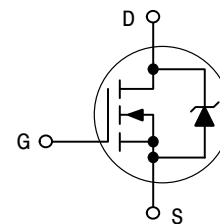
ON Semiconductor®

http://onsemi.com

200 mAMPS
60 VOLTS
$R_{DS(on)}$ = 5 Ω

N−Channel

TO−92
CASE 29
STYLE 22

STRAIGHT LEAD
BULK PACK

BENT LEAD
TAPE & REEL
AMMO PACK

MARKING DIAGRAM
AND PIN ASSIGNMENT

2N
7000
AYWW ▪

1
Source

3
Drain

2
Gate
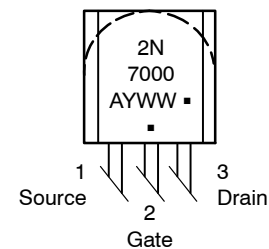
A	= Assembly Location
Y	= Year
WW	= Work Week
▪	= Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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2N7000G

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Drain−Source Breakdown Voltage	(V_{GS} = 0, I_D = 10 μAdc)	$V_{(BR)DSS}$	60	–	Vdc
Zero Gate Voltage Drain Current		I_{DSS}			
	(V_{DS} = 48 Vdc, V_{GS} = 0)		–	1.0	μAdc
	(V_{DS} = 48 Vdc, V_{GS} = 0, T_J = 125°C)		–	1.0	mAdc
Gate−Body Leakage Current, Forward	(V_{GSF} = 15 Vdc, V_{DS} = 0)	I_{GSSF}	–	−10	nAdc
ON CHARACTERISTICS (Note 1)					
Gate Threshold Voltage	(V_{DS} = V_{GS}, I_D = 1.0 mAdc)	$V_{GS(th)}$	0.8	3.0	Vdc
Static Drain−Source On−Resistance		$r_{DS(on)}$			Ω
	(V_{GS} = 10 Vdc, I_D = 0.5 Adc)		–	5.0	
	(V_{GS} = 4.5 Vdc, I_D = 75 mAdc)		–	6.0	
Drain−Source On−Voltage		$V_{DS(on)}$			Vdc
	(V_{GS} = 10 Vdc, I_D = 0.5 Adc)		–	2.5	
	(V_{GS} = 4.5 Vdc, I_D = 75 mAdc)		–	0.45	
On−State Drain Current	(V_{GS} = 4.5 Vdc, V_{DS} = 10 Vdc)	$I_{d(on)}$	75	–	mAdc
Forward Transconductance	(V_{DS} = 10 Vdc, I_D = 200 mAdc)	g_{fs}	100	–	μmhos
DYNAMIC CHARACTERISTICS					
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0, f = 1.0 MHz)	C_{iss}	–	60	pF
Output Capacitance		C_{oss}	–	25	
Reverse Transfer Capacitance		C_{rss}	–	5.0	
SWITCHING CHARACTERISTICS (Note 1)					
Turn−On Delay Time	(V_{DD} = 15 V, I_D = 500 mA, R_G = 25 Ω, R_L = 30 Ω, V_{gen} = 10 V)	t_{on}	–	10	ns
Turn−Off Delay Time		t_{off}	–	10	

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

ORDERING INFORMATION

Device	Package	Shipping†
2N7000G	TO−92 (Pb−Free)	1000 Units / Bulk
2N7000RLRAG	TO−92 (Pb−Free)	2000 Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.
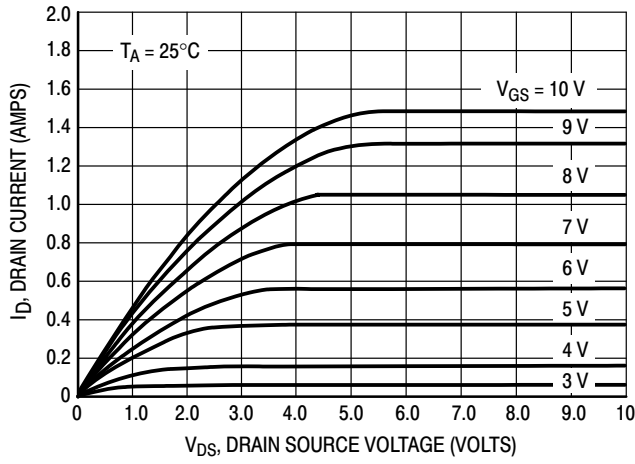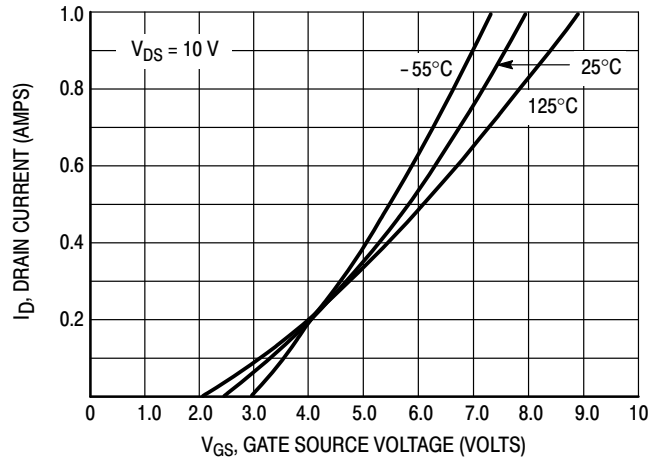
2N7000G

Figure 1. Ohmic Region

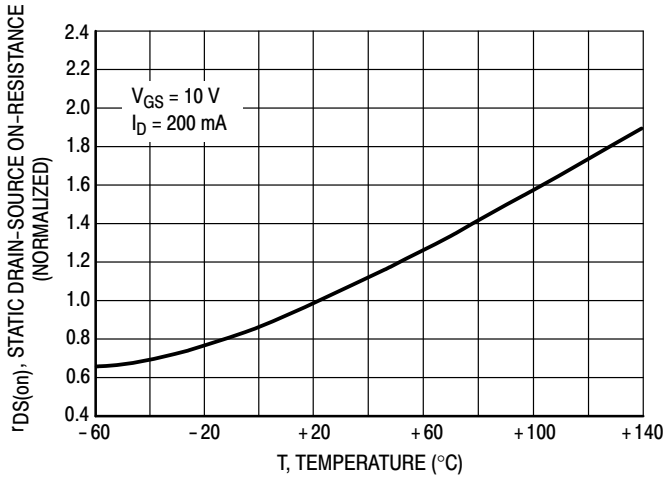**Figure 2. Transfer Characteristics**

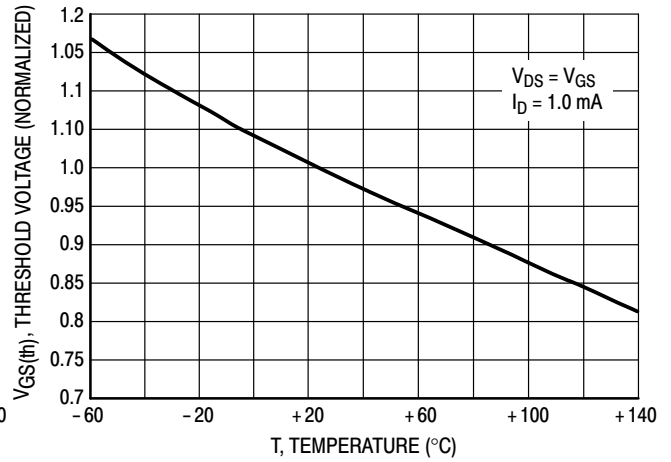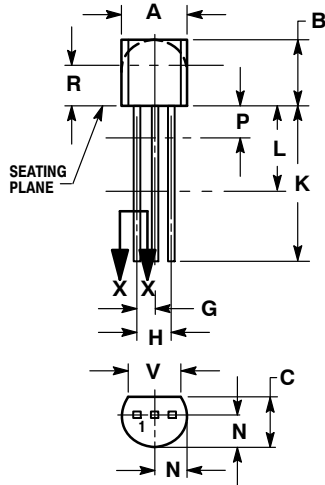**Figure 3. Temperature versus Static Drain−Source On−Resistance**

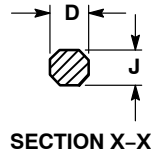**Figure 4. Temperature versus Gate Threshold Voltage**

PACKAGE DIMENSIONS

TO−92 (TO−226)
CASE 29−11
ISSUE AM

STRAIGHT LEAD
BULK PACK

SEATING PLANE

SECTION X−X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---
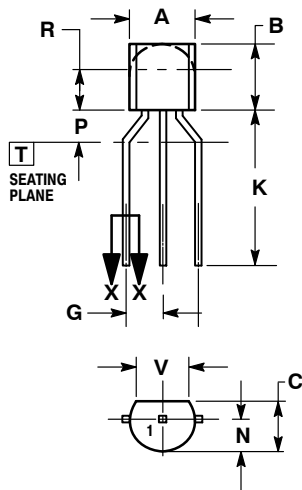
BENT LEAD
TAPE & REEL
AMMO PACK

SEATING PLANE
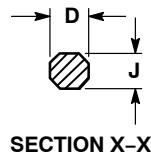
SECTION X−X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

Mouser Electronics

Authorized Distributor

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