

n-channel Power-Transistor

Features

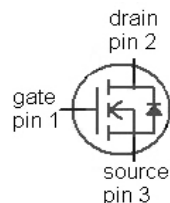
- for dc-motor drive systems
- N-channel, normal level
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant

Product Summary

V_{DS}	80	V
$R_{DS(on),max}$	7	mΩ
I_D	80	A



Type	IPP881N08N G
	
Package	PG-TO220-3
Marking	881N08N



Maximum ratings, at $T_j=25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_C=25\text{ °C}^{2)}$	80	A
		$T_C=100\text{ °C}$	72	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25\text{ °C}$	320	
Avalanche energy, single pulse ³⁾	E_{AS}	$I_D=73\text{ A}$, $R_{GS}=25\text{ Ω}$	150	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	$T_C=25\text{ °C}$	136	W
Operating and storage temperature	T_j , T_{stg}		-55 ... 175	°C
IEC climatic category; DIN IEC 68-1			55/175/56	

¹⁾ J-STD20 and JESD22

²⁾ See figure 2 for more detailed information

³⁾ See figure 7 for more detailed information

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - case	R_{thJC}		-	-	1.1	K/W
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Electrical characteristics, at $T_j=25\text{ }^{\circ}\text{C}$, unless otherwise specified
Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=1\text{ mA}$	80	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=75\text{ }\mu\text{A}$	2	-	3.5	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=80\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^{\circ}\text{C}$	-	0.1	1	μA
		$V_{DS}=80\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ }^{\circ}\text{C}$	-	1	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=73\text{ A}$	-	5.8	7	m Ω
		$V_{GS}=6\text{ V}, I_D=36\text{ A}$	-	7.4	12.3	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V}, f=1\text{ MHz}$	-	2920	3880	pF
Output capacitance	C_{oss}		-	1130	1500	
Reverse transfer capacitance	C_{rss}		-	60	-	

Gate Charge Characteristics⁴⁾

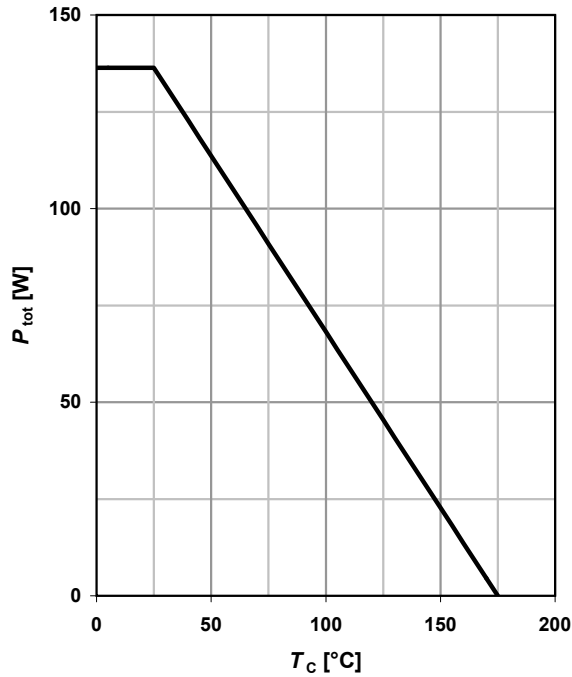
Gate to source charge	Q_{gs}	$V_{DD}=25\text{ V}, I_D=80\text{ A}, V_{GS}=0\text{ to }10\text{ V}$	-	16	-	nC
Gate to drain charge	Q_{gd}		-	8	-	
Gate charge total	Q_g		-	41	55	

Reverse Diode

Diode continuous forward current	I_S	$T_C=25\text{ }^{\circ}\text{C}$	-	-	80	A
Diode pulse current	$I_{S,pulse}$		-	-	320	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=73\text{ A}, T_j=25\text{ }^{\circ}\text{C}$	-	1.0	1.2	V

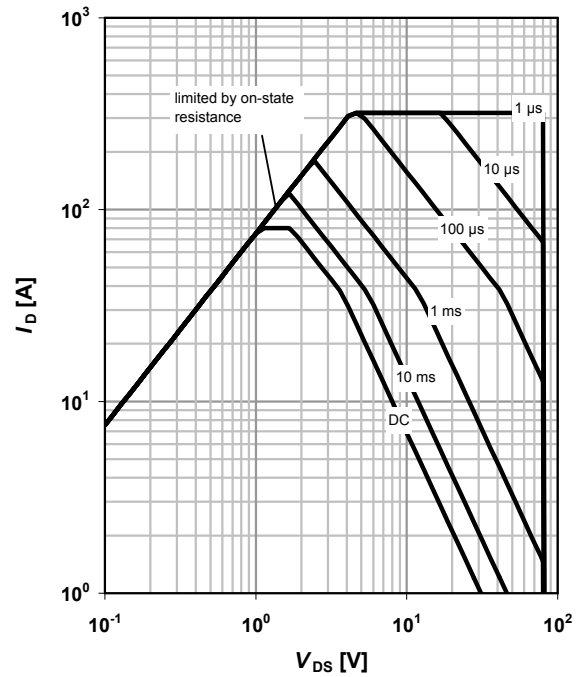
1 Power dissipation

$$P_{\text{tot}} = f(T_C)$$



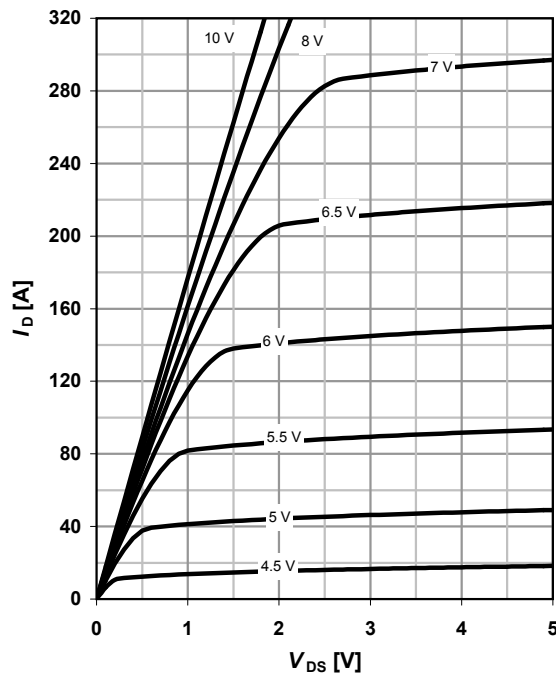
2 Safe operating area

$$I_D = f(V_{DS}); T_C = 25^\circ\text{C}; D = 0$$

parameter: t_p


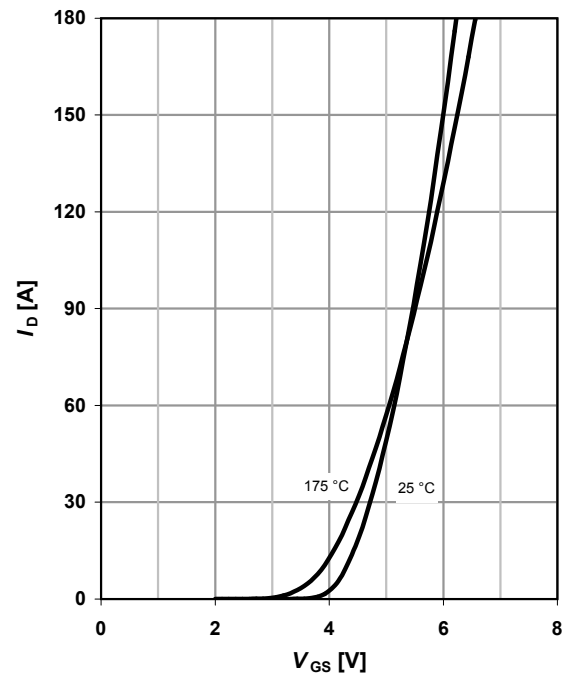
3 Typ. output characteristics

$$I_D = f(V_{DS}); T_J = 25^\circ\text{C}$$

parameter: V_{GS}


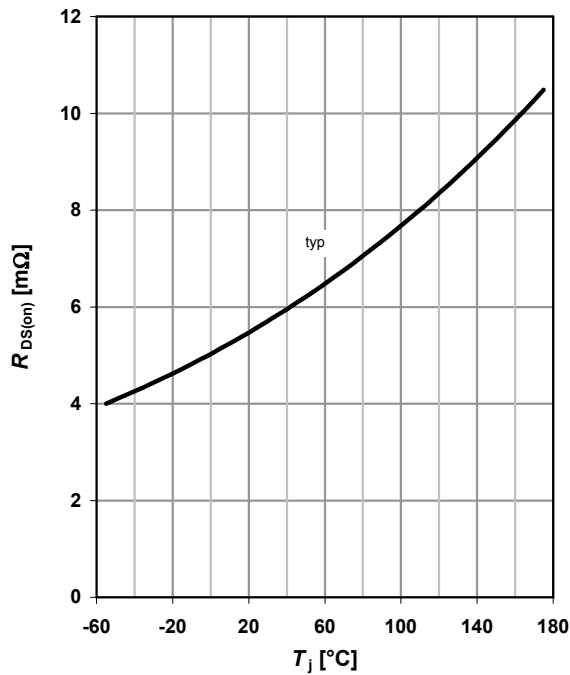
4 Typ. transfer characteristics

$$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|/R_{DS(\text{on})\text{max}}$$

parameter: T_J


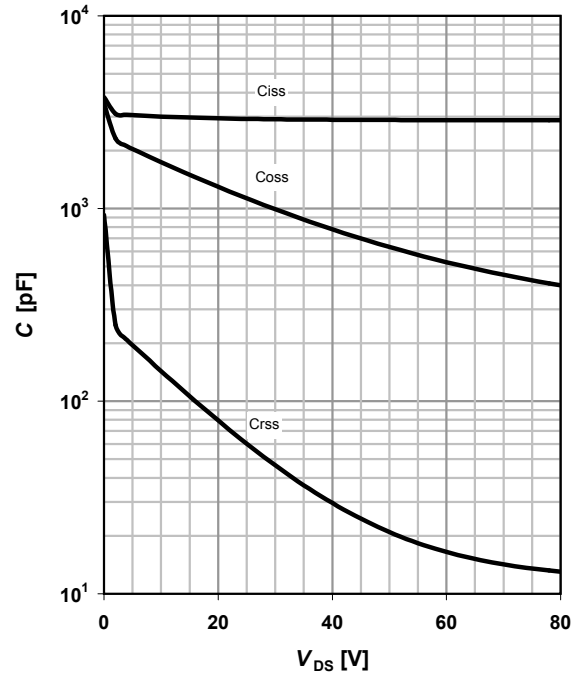
5 Drain-source on-state resistance

$$R_{DS(on)} = f(T_j); I_D = 73 \text{ A}; V_{GS} = 10 \text{ V}$$



6 Typ. capacitances

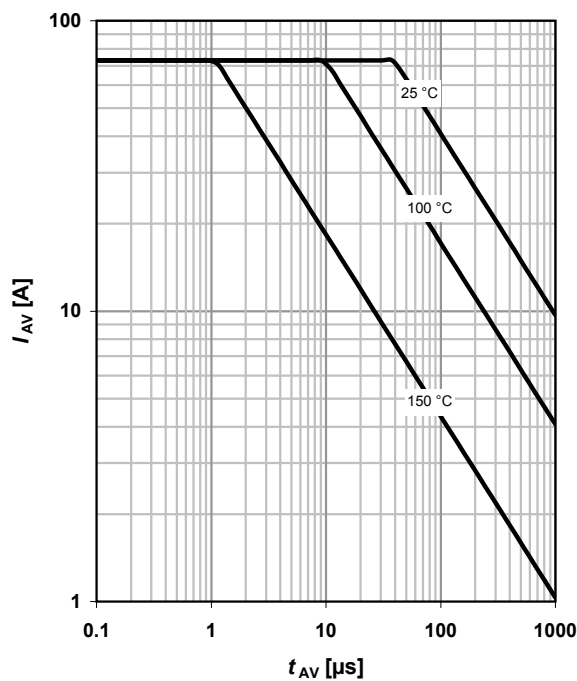
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$



7 Avalanche characteristics

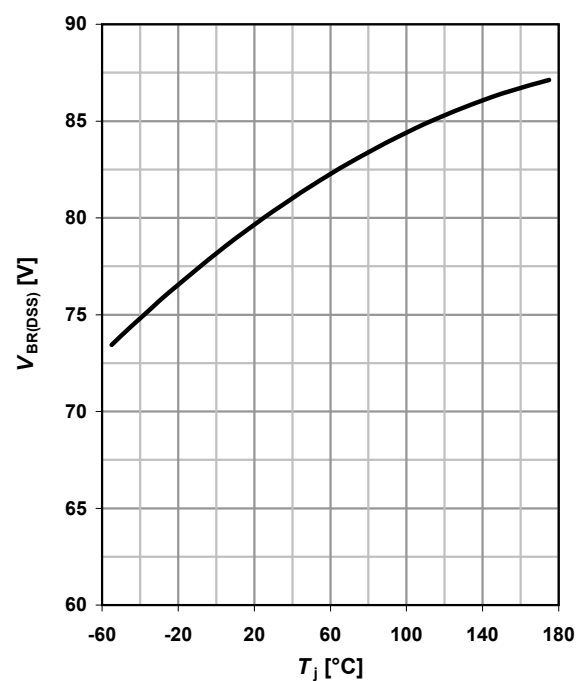
$$I_{AS} = f(t_{AV}); R_{GS} = 25 \Omega$$

parameter: $T_{j(start)}$

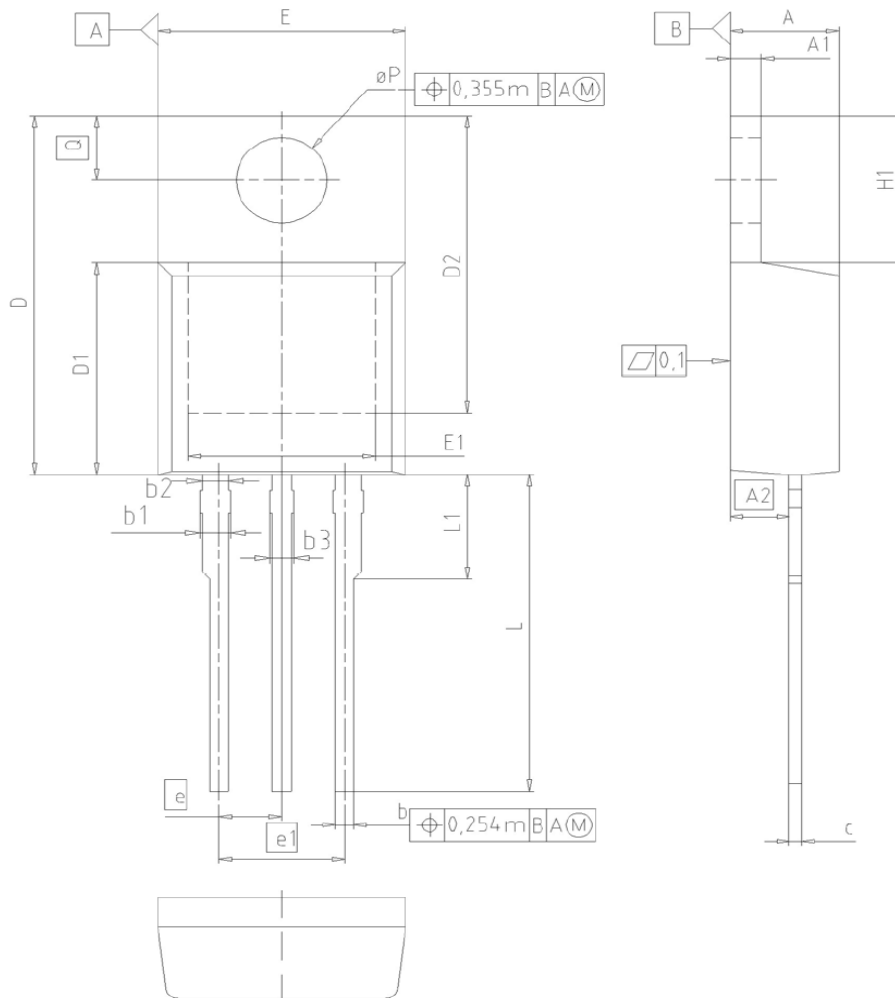


8 Drain-source breakdown voltage

$$V_{BR(DSS)} = f(T_j); I_D = 1 \text{ mA}$$



PG-TO220-3



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	1.17	1.40	0.046	0.055
A2	2.15	2.72	0.085	0.107
b	0.65	0.86	0.026	0.034
b1	0.95	1.40	0.037	0.055
b2	0.95	1.15	0.037	0.045
b3	0.65	1.15	0.026	0.045
c	0.33	0.60	0.013	0.024
D	14.81	15.95	0.583	0.628
D1	8.51	9.45	0.335	0.372
D2	12.19	13.10	0.480	0.516
E	9.70	10.36	0.382	0.408
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	3		3	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	-	4.80	-	0.189
ØP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

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