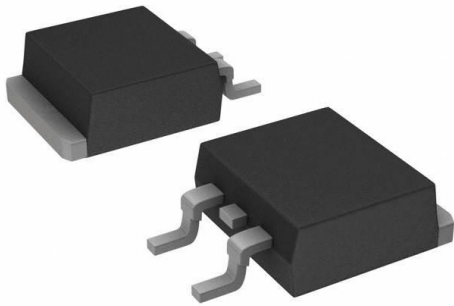


IPB108N15N3GATMA1 Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	IPB108N15N3GATMA1-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	IPB108N15N3GATMA1
Description	MOSFET N-CH 150V 83A D2PAK
Detailed Description	N-Channel 150 V 83A (Tc) 214W (Tc) Surface Mount PG-T0263-3



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:

IPB108N15N3GATMA1

Series:

OptiMOS™

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

150 V

Drive Voltage (Max Rds On, Min Rds On):

8V, 10V

Vgs(th) (Max) @ Id:

4V @ 160μA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

PG-T0263-3

Base Product Number:

IPB108

Manufacturer:

Infineon Technologies

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

83A (Tc)

Rds On (Max) @ Id, Vgs:

10.8mOhm @ 83A, 10V

Gate Charge (Qg) (Max) @ Vgs:

55 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

3230 pF @ 75 V

Power Dissipation (Max):

214W (Tc)

Mounting Type:

Surface Mount

Package / Case:

TO-263-3, D2PAK (2 Leads + Tab), TO-263AB

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



IPB108N15N3 G IPP111N15N3 G

IPI111N15N3 G

OptiMOS™3 Power-Transistor




Features

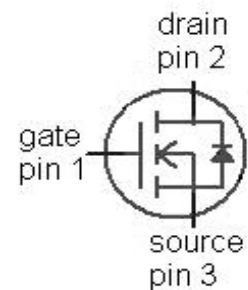
- N-channel, normal level
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant; Halogen free
- Qualified according to JEDEC¹⁾ for target application
- Ideal for high-frequency switching and synchronous rectification
- Halogen-free according to IEC61249-2-21

Product Summary

V_{DS}	150	V
$R_{DS(on),max}$ (TO263)	10.8	m Ω
I_D	83	A



Type	IPB108N15N3 G	IPP111N15N3 G	IPI111N15N3 G
			
Package	PG-TO263	PG-TO220-3	PG-TO262-3
Marking	108N15N	111N15N	111N15N



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_C=25\text{ °C}$	83	A
		$T_C=100\text{ °C}$	59	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25\text{ °C}$	332	
Avalanche energy, single pulse	E_{AS}	$I_D=83\text{ A}$, $R_{GS}=25\ \Omega$	330	mJ
Gate source voltage	V_{GS}		± 20	V
Power dissipation	P_{tot}	$T_C=25\text{ °C}$	214	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 3



IPB108N15N3 G IPP111N15N3 G

IPI111N15N3 G

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - case	R_{thJC}		-	-	0.7	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint	-	-	62	
		6 cm ² cooling area ³⁾	-	-	40	

Electrical characteristics, at $T_j=25\text{ °C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=1\text{ mA}$	150	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=160\text{ }\mu\text{A}$	2	3	4	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=120\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$	-	0.1	1	μA
		$V_{DS}=120\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ °C}$	-	10	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	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=83\text{ A},$ (TO220; TO262)	-	9.4	11.1	m Ω
		$V_{GS}=10\text{ V}, I_D=83\text{ A},$ (TO263)	-	9.1	10.8	
		$V_{GS}=8\text{ V}, I_D=41\text{ A},$ (TO220; TO262)	-	9.5	11.3	
		$V_{GS}=8\text{ V}, I_D=41\text{ A},$ (TO263)	-	9.2	11	
Gate resistance	R_G		-	2.4	-	Ω
Transconductance	g_{fs}	$ V_{DS} >2 I_D R_{DS(on)max},$ $I_D=83\text{ A}$	47	94	-	S

³⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical in still air.



IPB108N15N3 G IPP111N15N3 G

IPI111N15N3 G

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=75\text{ V},$ $f=1\text{ MHz}$	-	3230	-	pF
Output capacitance	C_{oss}		-	378	-	
Reverse transfer capacitance	C_{rss}		-	7	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=75\text{ V}, V_{GS}=10\text{ V},$ $I_D=83\text{ A}, R_G=1.6\ \Omega$	-	17	-	ns
Rise time	t_r		-	35	-	
Turn-off delay time	$t_{d(off)}$		-	32	-	
Fall time	t_f		-	9	-	

Gate Charge Characteristics⁴⁾

Gate to source charge	Q_{gs}	$V_{DD}=75\text{ V}, I_D=83\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	18	-	nC
Gate to drain charge	Q_{gd}		-	7	-	
Switching charge	Q_{sw}		-	16	-	
Gate charge total	Q_g		-	41	55	
Gate plateau voltage	$V_{plateau}$		-	5.7	-	
Output charge	Q_{oss}	$V_{DD}=75\text{ V}, V_{GS}=0\text{ V}$	-	106	141	nC

Reverse Diode

Diode continuous forward current	I_S	$T_C=25\text{ °C}$	-	-	83	A
Diode pulse current	$I_{S,pulse}$		-	-	332	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=83\text{ A},$ $T_J=25\text{ °C}$	-	1	1.2	V
Reverse recovery time	t_{rr}	$V_R=75\text{ V}, I_F=I_S,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	132	-	ns
Reverse recovery charge	Q_{rr}		-	415	-	nC

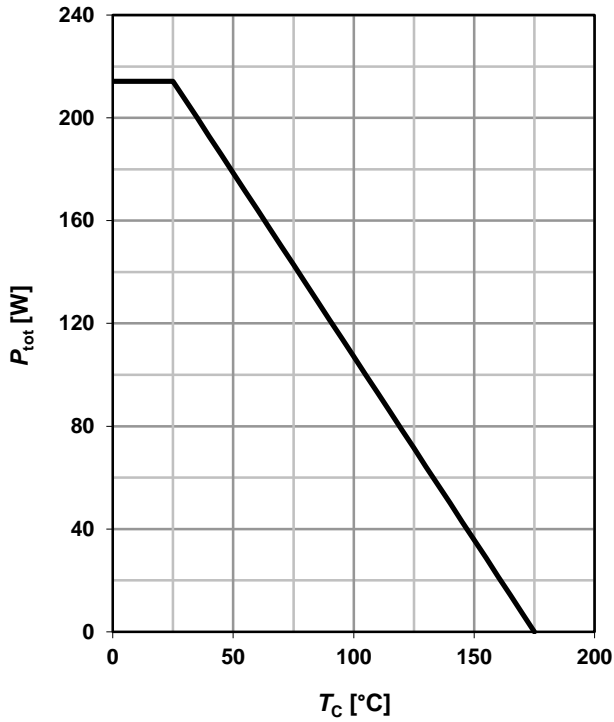
⁴⁾ See figure 16 for gate charge parameter definition

⁵⁾ Plotted values correspond to IPP11N15N3 G and IPI111N15N3 G. Corresponding values for IPB108N15N3 G are 0.3mΩ lower



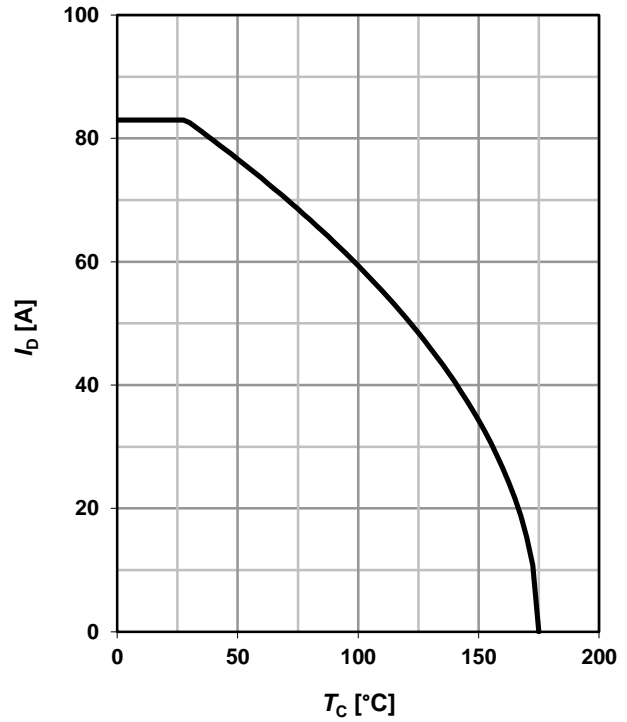
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

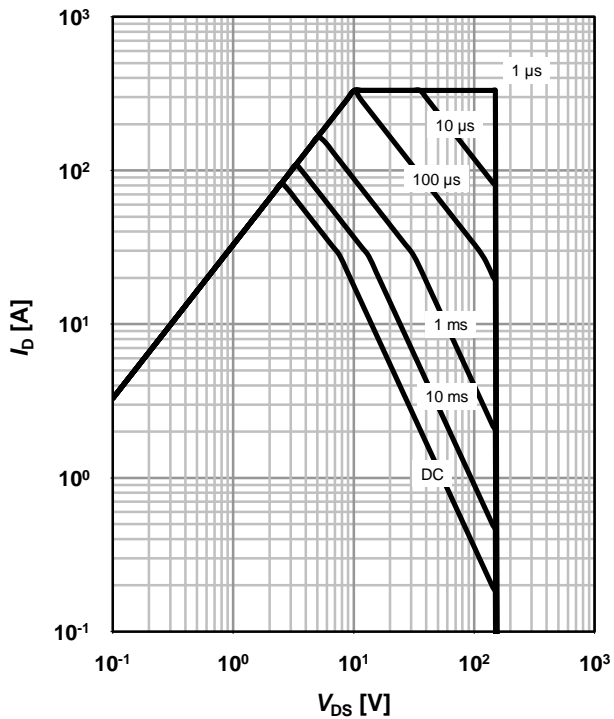
$I_D=f(T_C); V_{GS} \geq 10\text{ V}$



3 Safe operating area

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

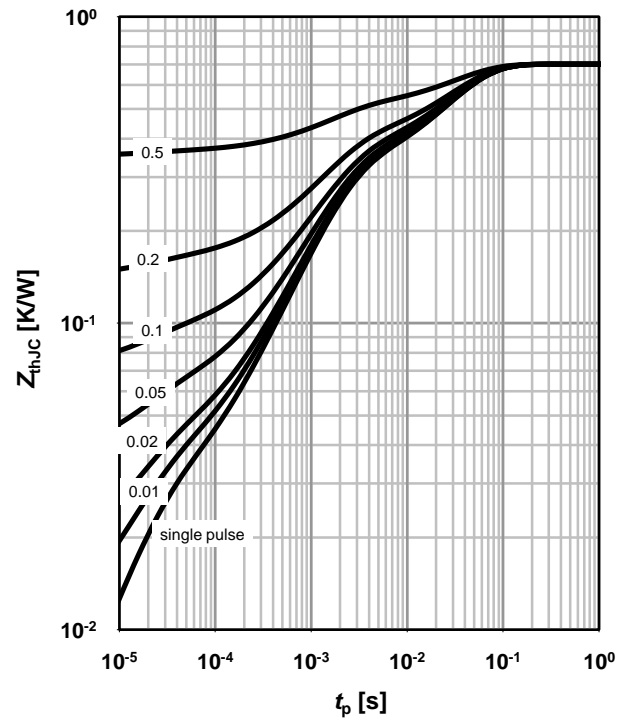
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

parameter: $D=t_p/T$

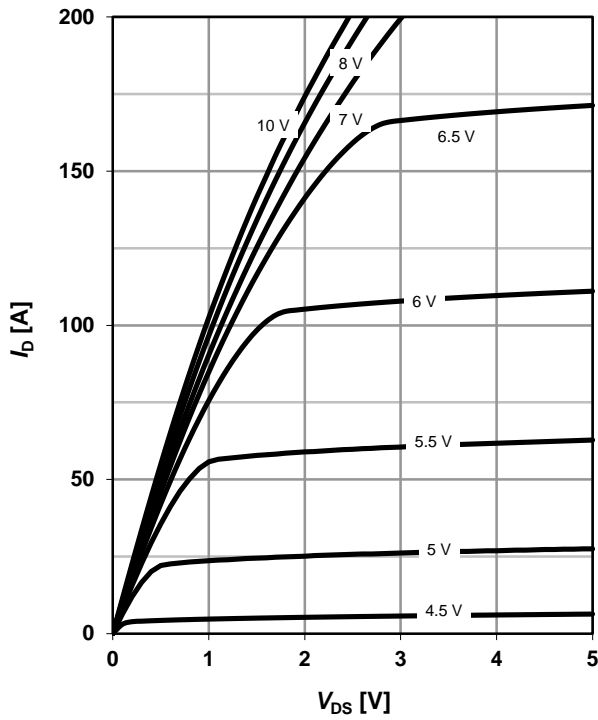




5 Typ. output characteristics

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

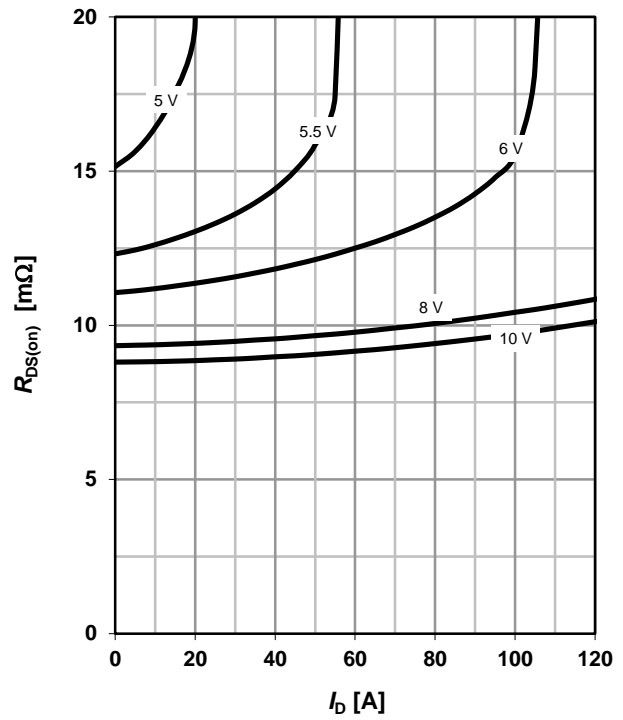
parameter: V_{GS}



6 Typ. drain-source on resistance ⁵⁾

$R_{DS(on)}=f(I_D); T_j=25\text{ }^\circ\text{C}$

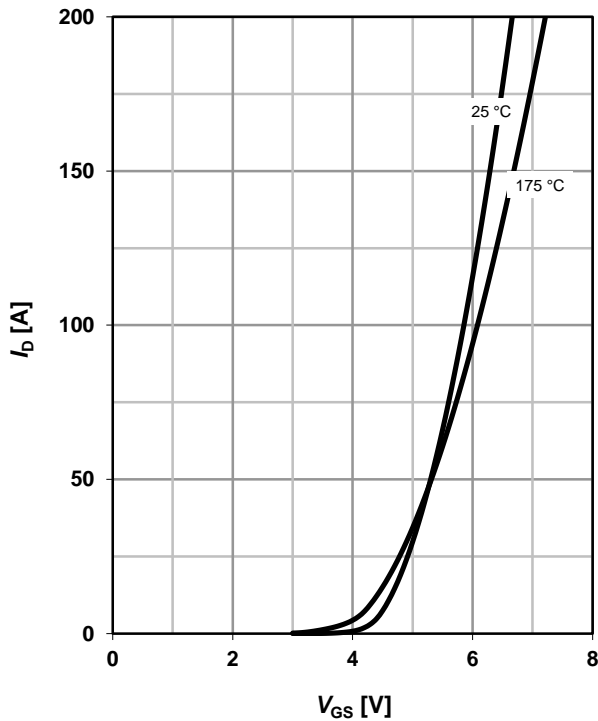
parameter: V_{GS}



7 Typ. transfer characteristics

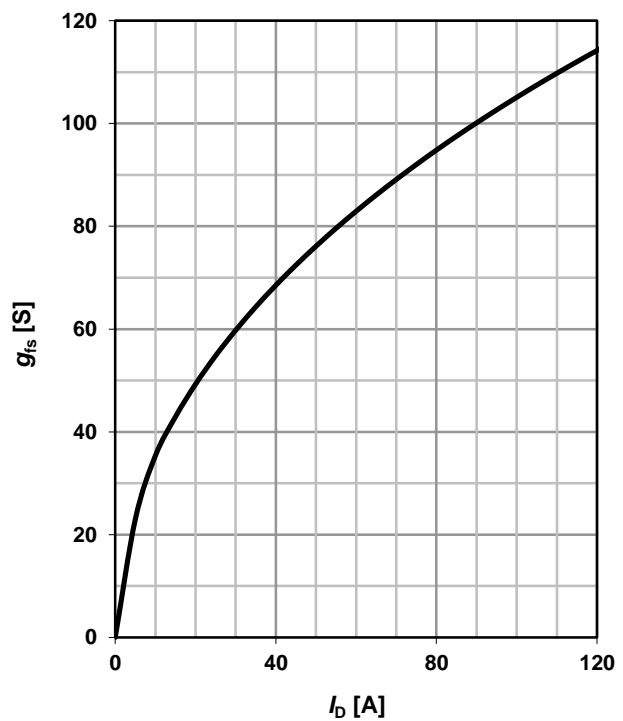
$I_D=f(V_{GS}); |V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



8 Typ. forward transconductance

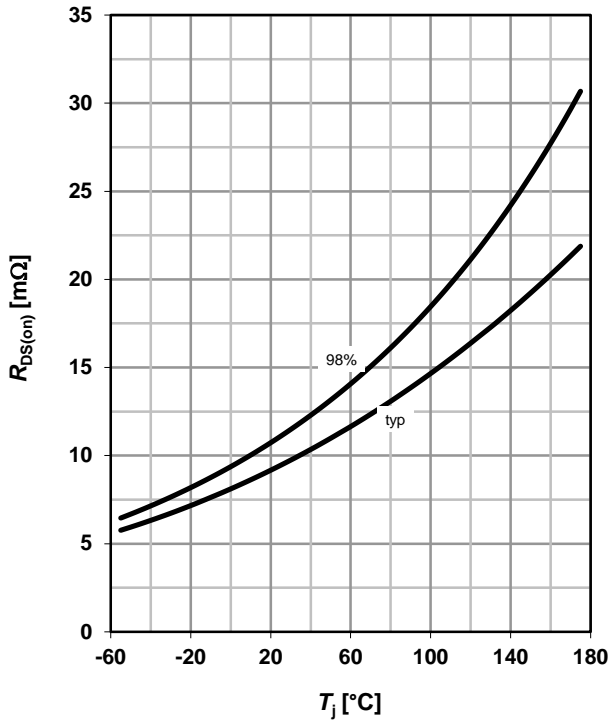
$g_{fs}=f(I_D); T_j=25\text{ }^\circ\text{C}$





9 Drain-source on-state resistance

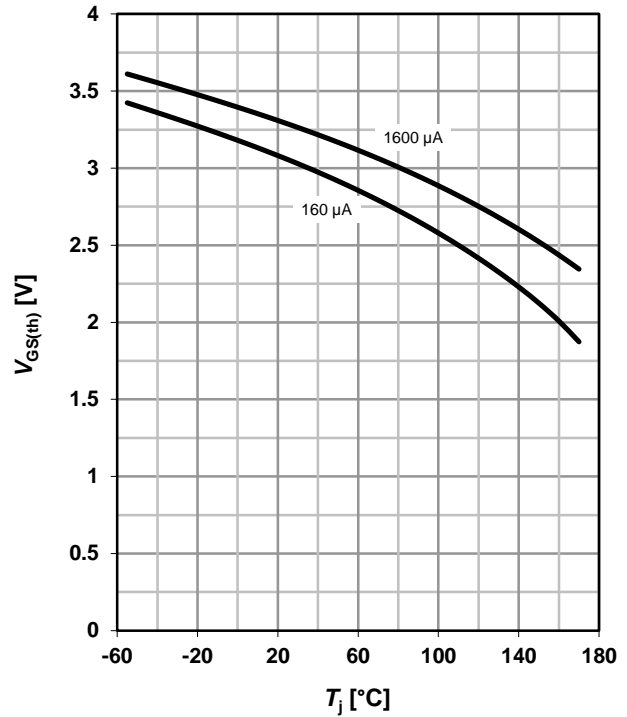
$R_{DS(on)}=f(T_j); I_D=83\text{ A}; V_{GS}=10\text{ V}$



10 Typ. gate threshold voltage

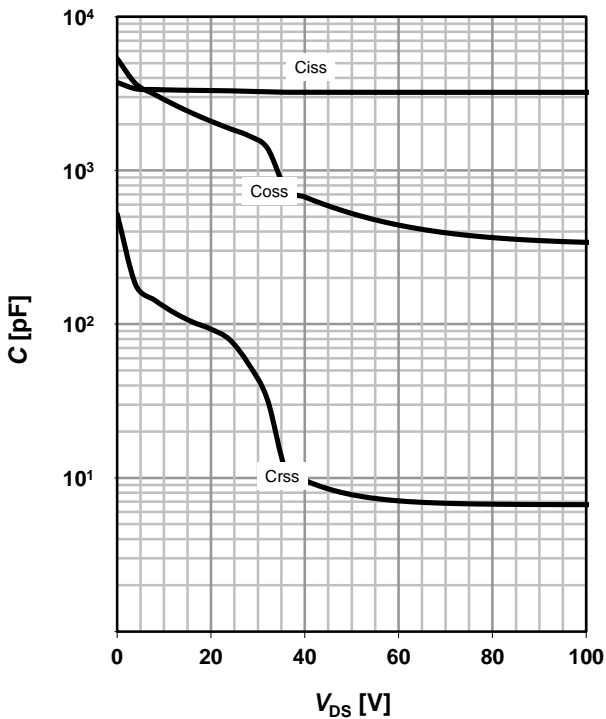
$V_{GS(th)}=f(T_j); V_{GS}=V_{DS}$

parameter: I_D



11 Typ. capacitances

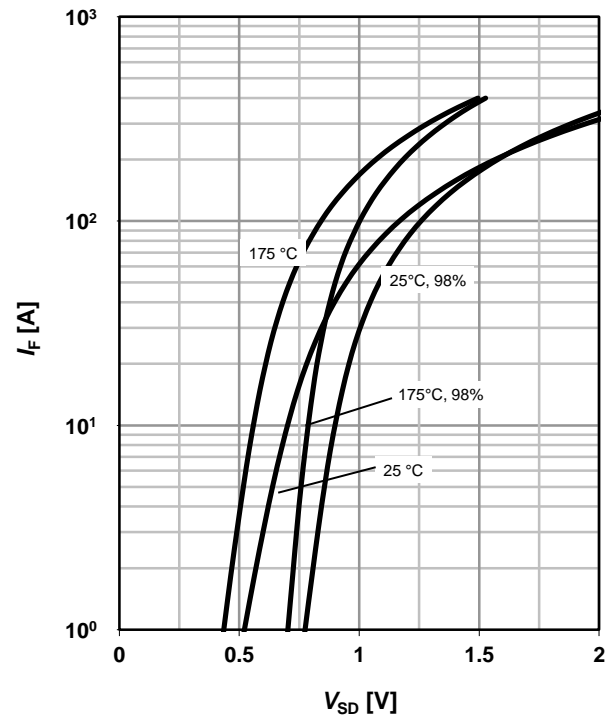
$C=f(V_{DS}); V_{GS}=0\text{ V}; f=1\text{ MHz}$



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

parameter: T_j

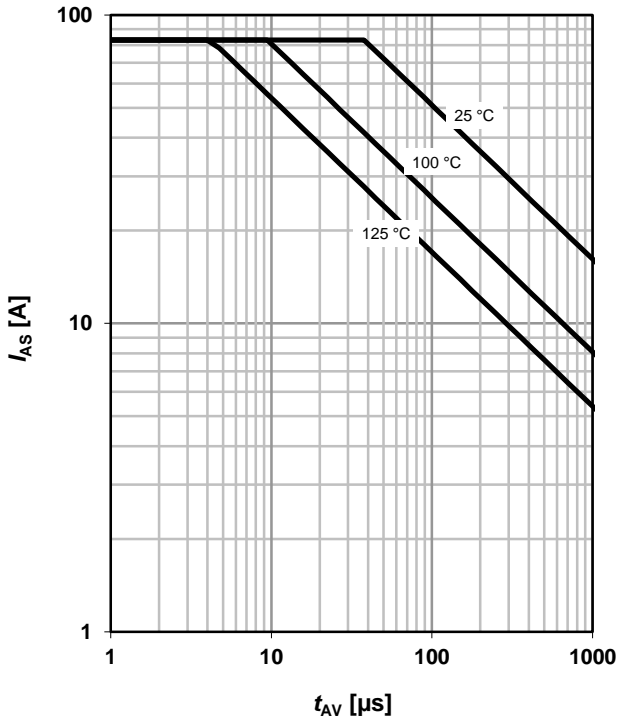




13 Avalanche characteristics

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

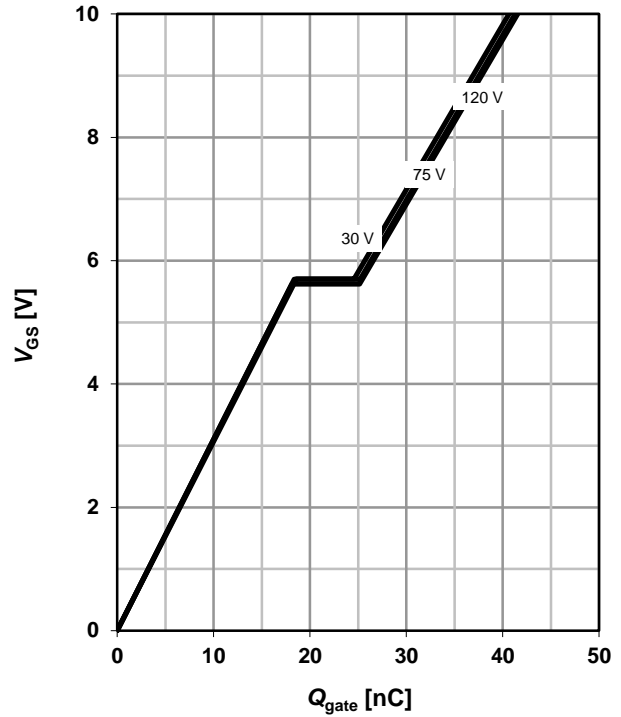
parameter: $T_{j(\text{start})}$



14 Typ. gate charge

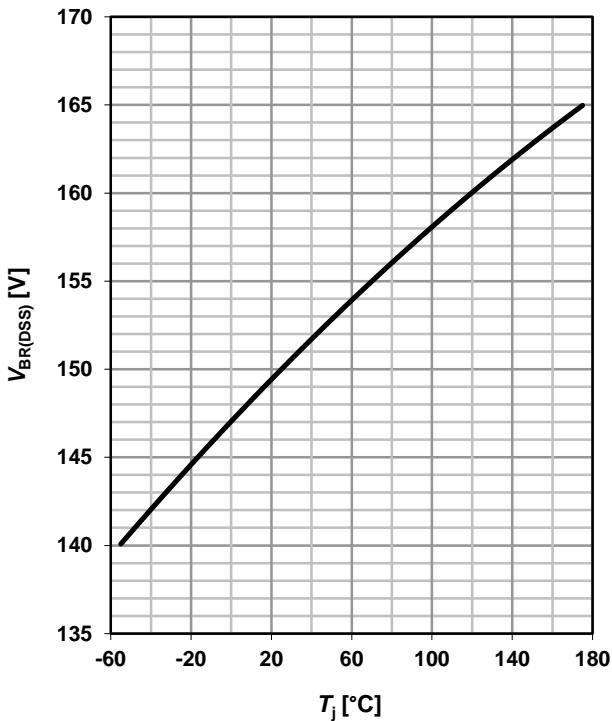
$V_{GS}=f(Q_{gate}); I_D=83 \text{ A pulsed}$

parameter: V_{DD}

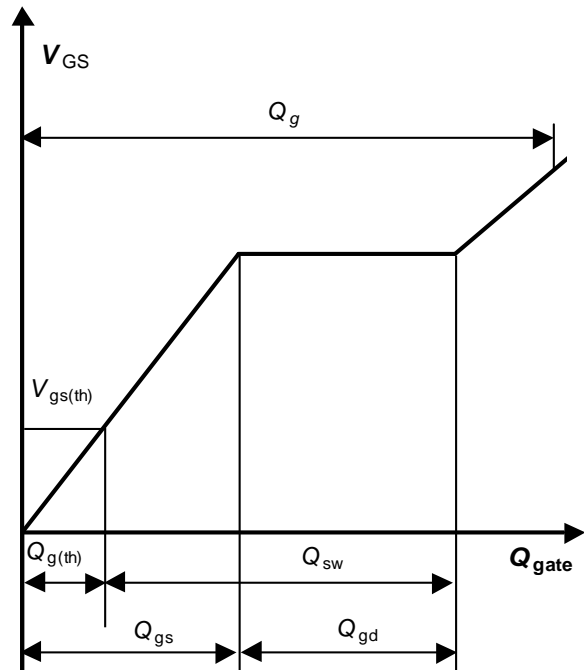


15 Drain-source breakdown voltage

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



16 Gate charge waveforms

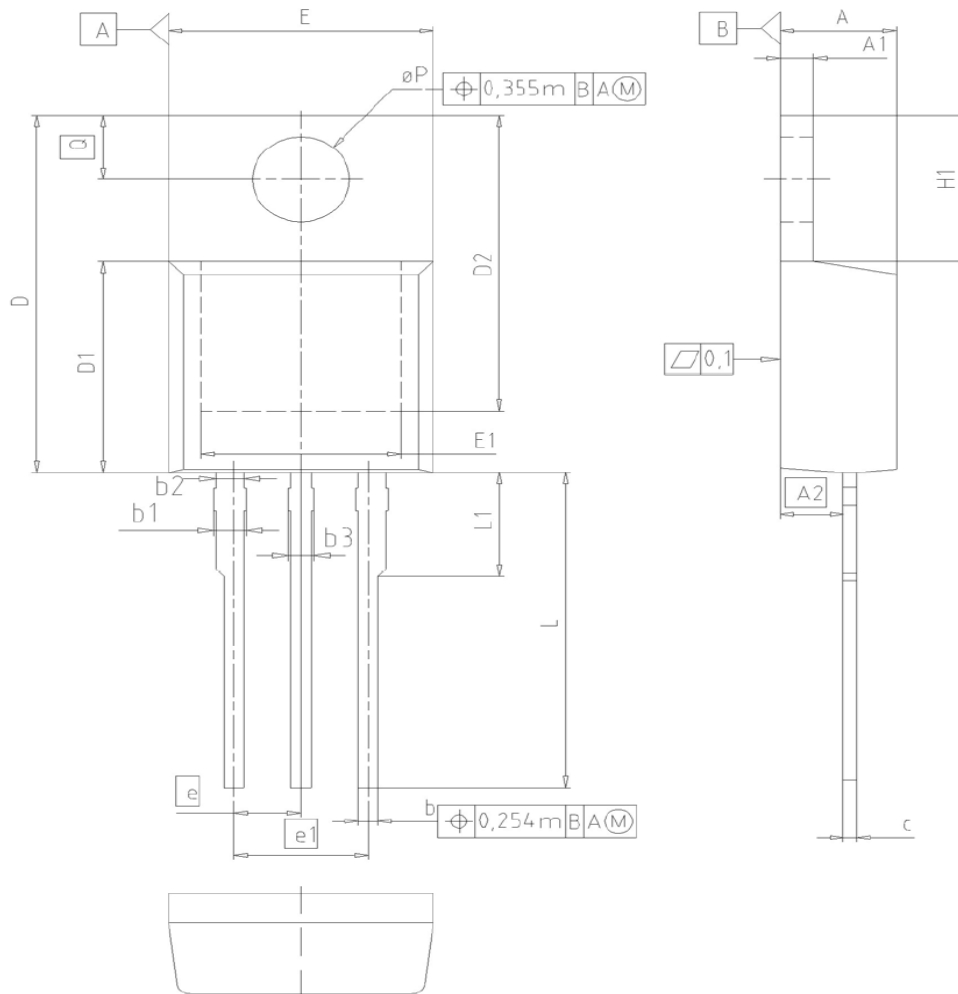




IPB108N15N3 G IPP111N15N3 G

IPI111N15N3 G

PG-TO220-3: Outline



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
ϕP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

DOCUMENT NO.
Z8B00003318

SCALE

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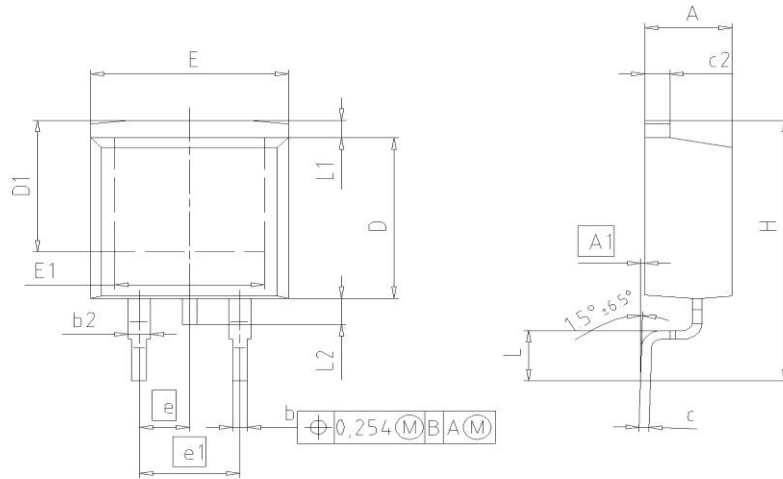
ISSUE DATE
23-08-2007

REVISION
05

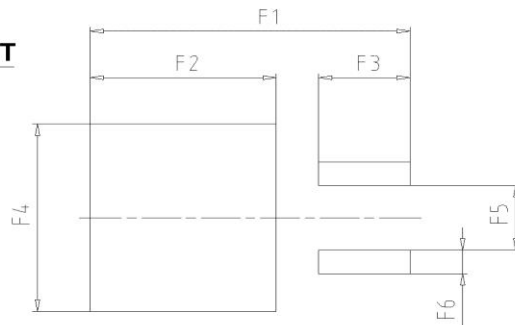


IPB108N15N3 G IPP111N15N3 G
 IPI111N15N3 G

PG-TO263: Outline



FOOTPRINT



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	0.00	0.25	0.000	0.010
b	0.65	0.85	0.026	0.033
b2	0.95	1.15	0.037	0.045
c	0.33	0.65	0.013	0.026
c2	1.17	1.40	0.046	0.055
D	8.51	9.45	0.335	0.372
D1	7.10	7.90	0.280	0.311
E	9.80	10.31	0.386	0.406
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	2		2	
H	14.61	15.88	0.575	0.625
L	2.29	3.00	0.090	0.118
L1	0.70	1.60	0.028	0.063
L2	1.00	1.78	0.039	0.070
F1	16.05	16.25	0.632	0.640
F2	9.30	9.50	0.366	0.374
F3	4.50	4.70	0.177	0.185
F4	10.70	10.90	0.421	0.429
F5	3.65	3.85	0.144	0.152
F6	1.25	1.45	0.049	0.057

DOCUMENT NO.
Z8B00003324

SCALE

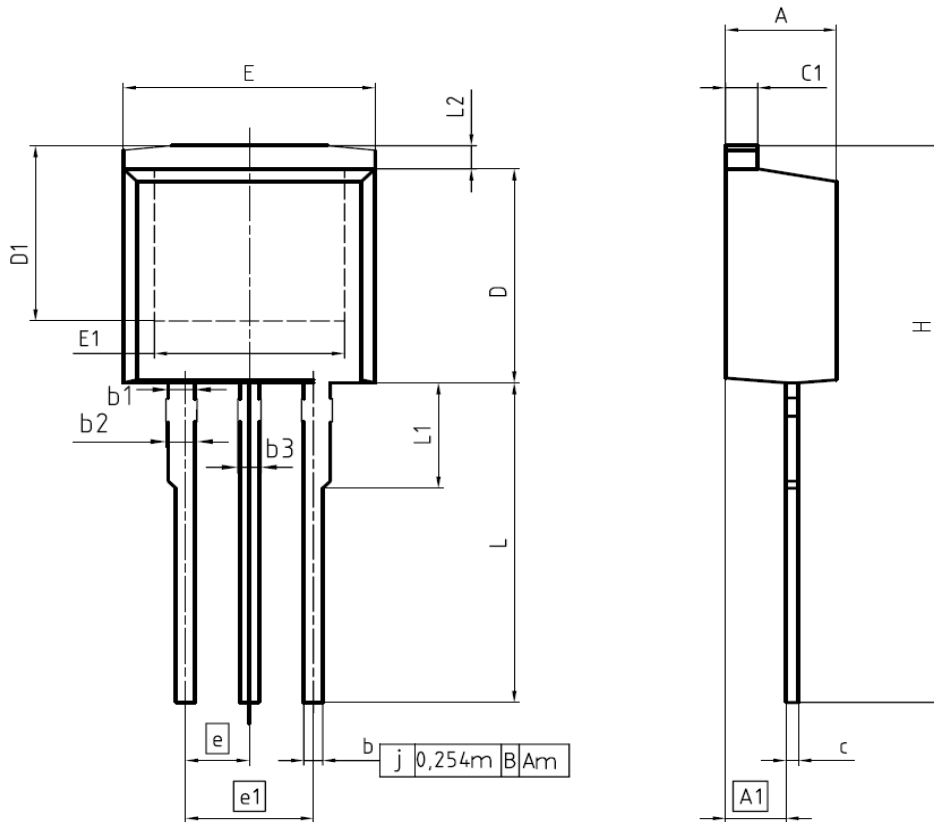
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ISSUE DATE
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REVISION
01



PG-TO262-3: Outline



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.300	4.572	0.169	0.180
A1	2.150	2.718	0.085	0.107
b	0.650	0.864	0.026	0.034
b1	0.950	1.093	0.037	0.043
b2	0.950	1.400	0.037	0.055
b3	0.650	1.118	0.026	0.044
c	0.330	0.600	0.013	0.024
c1	1.170	1.400	0.046	0.055
D	8.509	9.450	0.335	0.372
D1	6.900	-	0.272	-
E	9.700	10.363	0.382	0.408
E1	6.500	8.600	0.256	0.339
e	2.540		0.100	
e1	5.080		0.200	
N	3		3	
L	13.000	14.000	0.512	0.551
L1	-	4.800	-	0.189
L2	-	1.727	-	0.068

REFERENCE
JEDEC TO262

SCALE

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