OptiMOS®-P Power-Transistor

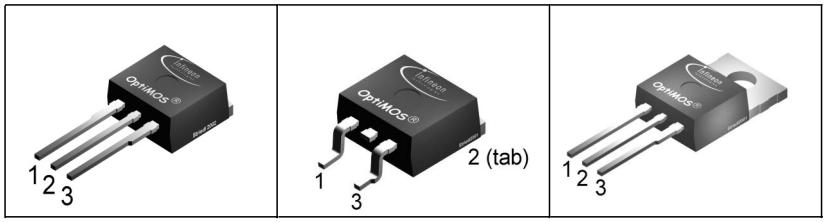
Feature

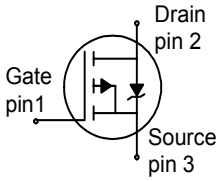
- P-Channel
- Enhancement mode
- Logic Level
- Automotive AEC Q101 qualified
- Green package (lead free)
- MSL1 up to 260°C
  peak reflow temperature
- 175°C operating temperature
- Avalanche rated
- d*v*/d*t* rated

Product Summary

V_{DS}	-30	V
$R_{DS(on)}$ max. SMD version	4	mΩ
I_D	-80	A

P- TO262 -3-1 | P- TO263 -3-2 | P- TO220 -3-1





Type	Package	Ordering Code	Marking
IPP80P03P3L-04	P- TO220 -3-1	-	3P03L04
IPB80P03P3L-04	P- TO263 -3-2	-	3P03L04
IPI80P03P3L-04	P- TO262 -3-1	-	3P03L04

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current [1)] T_C=25°C T_C=100°C	I_D	 -80 -80	A
Pulsed drain current T_C=25°C	$I_{D\ puls}$	-320	
Avalanche energy, single pulse I_D=-80 A , V_{DD}=-25V, R_{GS}=25Ω	E_{AS}	432	mJ
Reverse diode d*v*/d*t* I_S=-80A, V_{DS}=-24V, d*i*/d*t*=200A/µs, T_{jmax}=175°C	d*v*/d*t*	-6	kV/µs
Gate source voltage	V_{GS}	±20	V
Power dissipation T_C=25°C	P_{tot}	200	W
Operating and storage temperature	T_j , T_{stg}	-55... +175	°C
IEC climatic category; DIN IEC 68-1		55/175/56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - case	R_{thJC}	-	0.5	0.75	K/W
Thermal resistance, junction - ambient, leaded	R_{thJA}	-	-	62	
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	-	62	
@ 6 cm^2 cooling area [2)]		-	-	40	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS}=0, I_D=-250µA	$V_{(BR)DSS}$	-30	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D=-430µA	$V_{GS(th)}$	-1	-1.5	-2	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS}=-30V, V_{GS}=0, T_j=25°C		-	-0.1	-1	
V_{DS}=-30V, V_{GS}=0, T_j=150°C [3)]		-	-10	-100	
Gate-source leakage current V_{GS}=±20V, V_{DS}=0	I_{GSS}	-	± 10	± 100	nA
Drain-source on-state resistance [4)]	$R_{DS(on)}$				mΩ
V_{GS}=-4.5V, I_D=-50A		-	6.3	7.6	
V_{GS}=-4.5V, I_D=-50A, SMD version		-	6	7.3	
Drain-source on-state resistance [4)]	$R_{DS(on)}$				
V_{GS}=-10V, I_D=-80A		-	3.5	4.3	
V_{GS}=-10V, I_D=-80A, SMD version		-	3.2	4	

[1]Current limited by bondwire ; with an R_{thJC} = 0.75K/W the chip is able to carry I_D= 171A at 25°C, for detailed information see app.-note ANPS071E available at *www.infineon.com/optimos*

[2]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air; t≤10 sec.

[3]Defined by design. Not subject to production test.

[4]Diagrams are related to straight lead versions

Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	$\lvert V_{DS}\rvert \geq 2 \lvert I_D\rvert R_{DS(on)max}$, I_D=-80A	63	125	-	S
Input capacitance	C_{iss}	V_{GS}=0, V_{DS}=-25V, f=1MHz	-	7720	-	pF
Output capacitance	C_{oss}		-	2050	-	
Reverse transfer capacitance	C_{rss}		-	1673	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω	-	30	45	ns
Rise time	t_r		-	45	68	
Turn-off delay time	$t_{d(off)}$		-	200	300	
Fall time	t_f		-	180	270	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=-24V, I_D=-80A	-	-25	-38	nC
Gate to drain charge	Q_{gd}		-	-85	-128	
Gate charge total	Q_g	V_{DD}=-24V, I_D=-80A, V_{GS}=0 to -10V	-	-200	-300	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=-24V, I_D=-80A	-	-3	-	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	-80	A
Inv. diode direct current, pulsed	I_{SM}		-	-	-320	
Inverse diode forward voltage	V_{SD}	V_{GS}=0, $\lvert I_F\rvert = \lvert I_D\rvert$	-	-1.1	-1.3	V
Reverse recovery time	t_{rr}	V_R=-15V, $\lvert I_F\rvert = \lvert I_D\rvert$, di_F/dt=100A/µs	-	60	75	ns
Reverse recovery charge	Q_{rr}		-	75	95	nC

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Further information
Please notice that the part number is BIPP80P03P3L-04, BIPB80P03P3L-04 and BIPI80P03P3L-04, for simplicity the device is referred to by the term IPP80P03P3L-04, IPB80P03P3L-04 and IPI80P03P3L-04 throughout this documentation