

OptiMOS[®] - T Power-Transistor

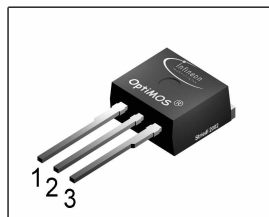
Feature

- n-Channel
- Enhancement mode
- Logic Level
- AEC Q101 qualified
- Low On-Resistance $R_{DS(on)}$
- Green package (lead free)
- MSL1 up to 260°C peak reflow temperature
- 175°C operating temperature
- Avalanche rated

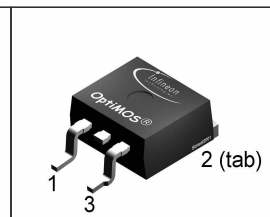
Product Summary

V_{DS}	55	V
$R_{DS(on)}$ max. SMD version	2.7	mΩ
I_D	100	A

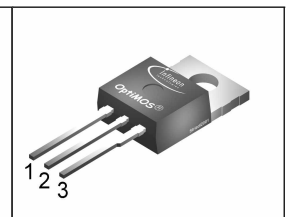
P- TO262 -3-1



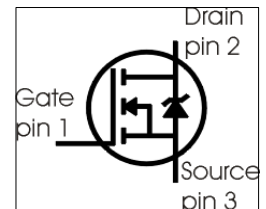
P- TO263 -3-2



P- TO220 -3-1



Type	Package	Ordering Code	Marking
IPP100N06S3L-03	P- TO220 -3-1	-	3PN06L03
IPB100N06S3L-03	P- TO263 -3-2	-	3PN06L03
IPI100N06S3L-03	P- TO262 -3-1	-	3PN06L03



Maximum Ratings, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current, $V_{DS}=10V^1)$	I_D	100	A
$T_C=25^\circ\text{C}$		100	
$T_C=100^\circ\text{C}$		100	
Pulsed drain current	$I_{D \text{ puls}}$	400	
$T_C=25^\circ\text{C}$			
Avalanche energy, single pulse	E_{AS}	690	mJ
$I_D=80A$, $V_{DD}=25V$, $R_{GS}=25\Omega$			
Drain gate voltage	V_{DG}	55	V
Gate source voltage ²⁾	V_{GS}	± 16	
Power dissipation	P_{tot}	300	W
$T_C=25^\circ\text{C}$			
Operating and storage temperature	T_j, T_{stg}	-55... +175	$^\circ\text{C}$
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	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 ³⁾		-	-	40	

Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage $V_{GS}=0V, I_D=1mA$	$V_{(BR)DSS}$	55	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D=225\mu A$	$V_{GS(th)}$	1.2	1.7	2.2	
Zero gate voltage drain current $V_{DS}=55V, V_{GS}=0V, T_j=25^{\circ}C$ $V_{DS}=55V, V_{GS}=0V, T_j=125^{\circ}C^4)$	I_{DSS}	- -		1 50	μA
Gate-source leakage current $V_{GS}=16V, V_{DS}=0V$	I_{GSS}	-		100	
Drain-source on-state resistance $V_{GS}=5V, I_D=78A$ $V_{GS}=5V, I_D=78A, SMD\ version$	$R_{DS(on)}$	- -	- -	4.6 3.9	$m\Omega$
Drain-source on-state resistance $V_{GS}=10V, I_D=80A$ $V_{GS}=10V, I_D=80A, SMD\ version$	$R_{DS(on)}$	- -	- -	3 2.7	

¹Current limited by bondwire ; with an $R_{thJC} = 0.5\text{K/W}$ the chip is able to carry $I_D = 230\text{A}$ at 25°C , for detailed information see app.-note ANPS071E available at www.infineon.com/optimos

²Qualified at -5V and $+16\text{V}$

³Device on $40\text{mm} \times 40\text{mm} \times 1.5\text{mm}$ epoxy PCB FR4 with 6cm^2 (one layer, $70\mu\text{m}$ thick) copper area for drain connection. PCB is vertical without blown air.

⁴Defined by design. Not subject to production test.

Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic Characteristics¹⁾

Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V,$ $f=1MHz$	-	23800	-	pF
Output capacitance	C_{oss}		-	2880	-	
Reverse transfer capacitance	C_{rss}		-	2820	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=27.5V, V_{GS}=10V,$ $I_D=80A,$ $R_G=2.1\Omega$	-	39	-	ns
Rise time	t_r		-	110	-	
Turn-off delay time	$t_{d(off)}$		-	140	-	
Fall time	t_f		-	162	-	

Gate Charge Characteristics¹⁾

Gate to source charge	Q_{gs}	$V_{DD}=27.5V, I_D=80A$	-	75	-	nC
Gate to drain charge	Q_{gd}		-	210	-	
Gate charge total	Q_g	$V_{DD}=27.5V, I_D=80A,$ $V_{GS}=0 \text{ to } 10V$	-	415	-	
Gate plateau voltage	$V_{(plateau)}$	$V_{DD}=27.5V, I_D=80A$	-	3.5	-	V

Reverse Diode¹⁾

Inverse diode continuous forward current	I_S	$T_C=25^\circ C$	-	-	100	A
Inv. diode direct current, pulsed	I_{SM}		-	-	400	
Inverse diode forward voltage	V_{SD}	$V_{GS}=0V, I_F=80A$	-	0.9	1.3	V
Reverse recovery time	t_{rr}	$V_R=30V, I_F=I_S,$ $di_F/dt=100A/\mu s$	-	70	-	ns
Reverse recovery charge	Q_{rr}		-	80	-	

¹⁾ Defined by design. Not subject to production test.

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Further information

Please notice that the part number is BIPP100N06S3L-03, BIPB100N06S3L-03 and BIP100N06S3L-03, for simplicity the device is referred to by the term IPP100N06S3L-03, IPB100N06S3L-03 and IPI100N06S3L-03 throughout this documentation