

OptiMOS[®]2 Small-Signal-Transistor

Features

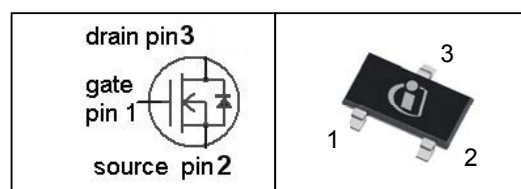
- N-channel
- Enhancement mode
- Logic level (4.5V)
- Avalanche rated
- Footprint compatible to SOT23
- dv/dt rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101



Product Summary

V_{DS}	30	V
$R_{DS(on),max}$	$V_{GS}=10\text{ V}$	23
	$V_{GS}=4.5\text{ V}$	36
I_D	3.7	A

PG-SC-59



Type	Package	Tape and Reel Information	Marking	Lead Free	Packing
BSR302N	PG-SC-59	L6327 = 3000 pcs. / reel	LEs	Yes	Non dry

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_A=25\text{ °C}$	3.7	A
		$T_A=70\text{ °C}$	2.9	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	14.7	
Avalanche energy, single pulse	E_{AS}	$I_D=3.7\text{ A}$, $R_{GS}=25\ \Omega$	30	mJ
Reverse diode dv/dt	dv/dt	$I_D=3.7\text{ A}$, $V_{DS}=16\text{ V}$, $di/dt=200\text{ A}/\mu\text{s}$, $T_{j,max}=150\text{ °C}$	6	kV/ μs
Gate source voltage	V_{GS}		± 20	V
Power dissipation	P_{tot}	$T_A=25\text{ °C}$	0.5	W
Operating and storage temperature	T_j , T_{stg}		-55 ... 150	$^{\circ}\text{C}$
ESD Class		JESD22-A114-HMB	0 (0V to 250V)	
Soldering Temperature			260 $^{\circ}\text{C}$	
IEC climatic category; DIN IEC 68-1			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - minimal footprint	R_{thJA}		-	-	250	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	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=30\text{ }\mu\text{A}$	1.2	1.7	2	
Drain-source leakage current	I_{DSS}	$V_{DS}=30\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^\circ\text{C}$	-	-	1	μA
		$V_{DS}=30\text{ V}, V_{GS}=0\text{ V}, T_j=150\text{ }^\circ\text{C}$	-	-	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{ V}, I_D=2.9\text{ A}$	-	26	36	$\text{m}\Omega$
		$V_{GS}=10\text{ V}, I_D=3.7\text{ A}$	-	18	23	
Transconductance	g_{fs}	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=3.7\text{ A}$		12	-	S

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=15\text{ V},$ $f=1\text{ MHz}$	-	564	750	pF
Output capacitance	C_{oss}		-	202	269	
Reverse transfer capacitance	C_{rss}		-	28	43	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15\text{ V}, V_{GS}=10\text{ V},$ $I_D=3.7\text{ A}, R_G=2.7\ \Omega$	-	6.8	-	ns
Rise time	t_r		-	3.2	-	
Turn-off delay time	$t_{d(off)}$		-	16.2	-	
Fall time	t_f		-	2.2	-	

Gate Charge Characteristics

Gate to source charge	Q_{gs}	$V_{DD}=15\text{ V}, I_D=3.7\text{ A},$ $V_{GS}=0\text{ to }5\text{ V}$	-	1.6	2.2	nC
Gate to drain charge	Q_{gd}		-	1.1	1.7	
Gate charge total	Q_g		-	4.4	6.6	
Gate plateau voltage	$V_{plateau}$		-	2.9	-	V

Reverse Diode

Diode continuous forward current	I_S	$T_A=25\text{ }^\circ\text{C}$	-	-	0.8	A
Diode pulse current	$I_{S,pulse}$		-	-	14.7	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=3.7\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	0.8	1.2	V
Reverse recovery time	t_{rr}	$V_R=15\text{ V}, I_F=3.7\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	13.5	-	ns
Reverse recovery charge	Q_{rr}		-	5.0	-	nC