

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	BSC027N04LSG
▶ Overseas	Part Number	BSC027N04LSG
▶ Equivalent	Part Number	BSC027N04LSG

EV is the abbreviation of name EVVO

40V N-Channel Enhancement Mode MOSFET

Description

The BSC027N04LSG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a

Battery protection or in other Switching application.

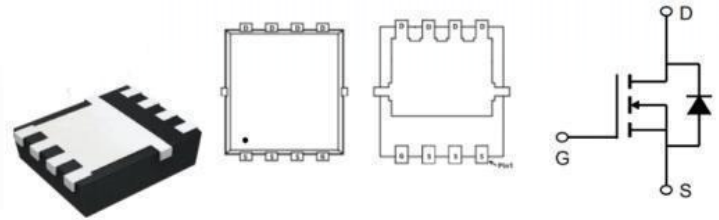
Application

- Battery protection
- Load switch
- Uninterruptible power supply

General Features

- $V_{DS} = 40V$ $I_D = 120A$
- $R_{DS(ON)} = 2.5 m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} = 3.6 m\Omega @ V_{GS}=4.5V$

PDFN5*6-8L Pin Configuration



Package Marking and Ordering Information

Product ID	Package	Marking	QTY(PCS)	Packing method
BSC027N04LSG	PDFN5*6-8L	T36END	5000	Reel

Absolute Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

Symbol	Parameter	SLD120N04T	Units
V_{DSS}	Drain-Source Voltage	40	V
I_D	Drain Current	- Continuous ($T_C = 25^\circ C$)	120
		- Continuous ($T_C = 100^\circ C$)	75
I_{DM}	Drain Current - Pulsed (Note 1)	450	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	200	mJ
P_D	Power Dissipation ($T_C = 25^\circ C$)	156	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.8	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ C$

40V N-Channel Enhancement Mode MOSFET

Electrical Characteristics

 $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0	1.5	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	--	2.7	3.6	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$	--	3.6	5.0	

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	4820	-	pF
C_{oss}	Output Capacitance		--	397	-	pF
C_{rss}	Reverse Transfer Capacitance		--	390	-	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{ V}, V_{DS} = 15\text{ V},$ $I_D = 60\text{ A}, R_G = 4.7\ \Omega$	--	12	--	ns	
t_r	Turn-On Rise Time		--	66	--	ns	
$t_{d(off)}$	Turn-Off Delay Time		(Note 3)	--	48	--	ns
t_f	Turn-Off Fall Time		--	45	--	ns	
Q_g	Total Gate Charge	$V_{DS} = 20\text{ V}, I_D = 60\text{ A},$ $V_{GS} = 10\text{ V}$	--	104	--	nC	
Q_{gs}	Gate-Source Charge		(Note 3)	--	14.8	--	nC
Q_{gd}	Gate-Drain Charge		--	27	--	nC	
R_G	Gate Resistance	$f = 1\text{ MHz}$	--	2.8	--	Ω	

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	120	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	480	A
V_{SD}	Drain to Source Diode Forward Voltage, $V_{GS} = 0\text{ V}, I_{SD} = 20\text{ A}, T_J = 25^\circ\text{C}$	--	--	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}, V_{DD} = 50\text{ V}, V_G = 10\text{ V}, R_G = 25\ \Omega, L = 0.5\text{ mH}$.
3. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycles $\leq 0.5\%$

40V N-Channel Enhancement Mode MOSFET

Typical Characteristics

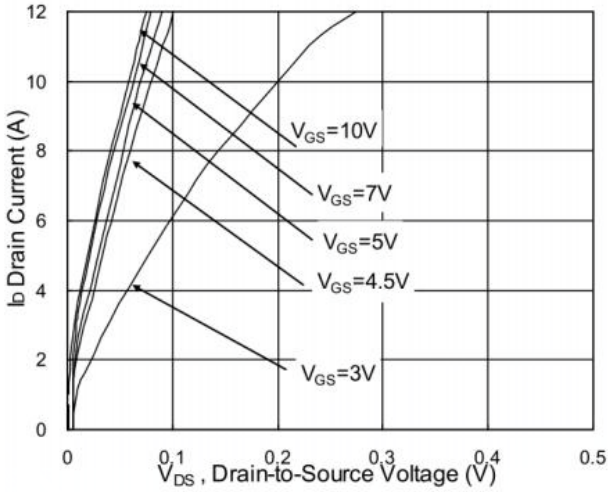


Fig.1 Typical Output Characteristics

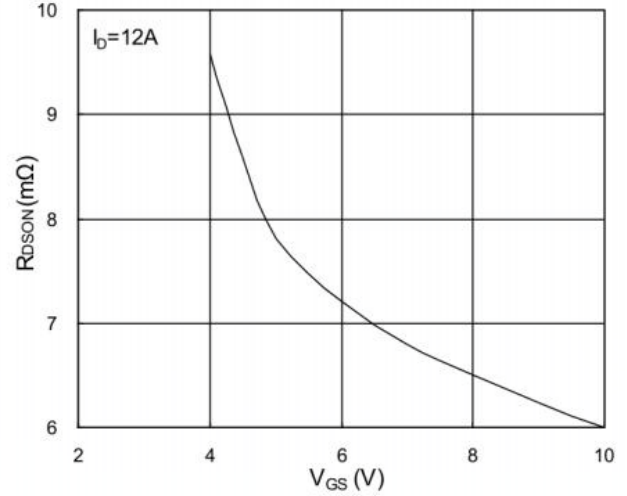


Fig.2 On-Resistance vs. G-S Voltage

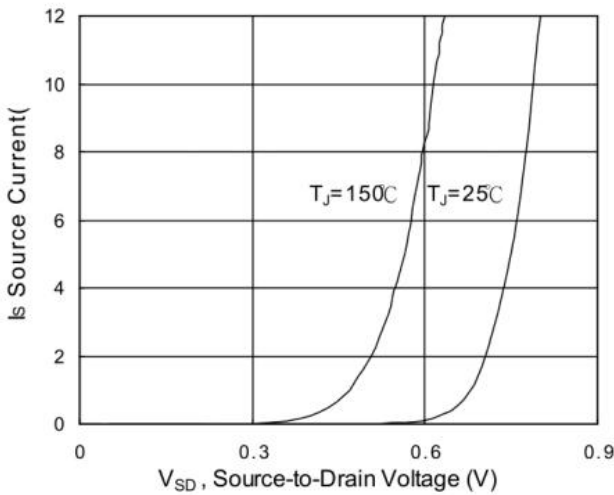


Fig.3 Forward Characteristics of Reverse

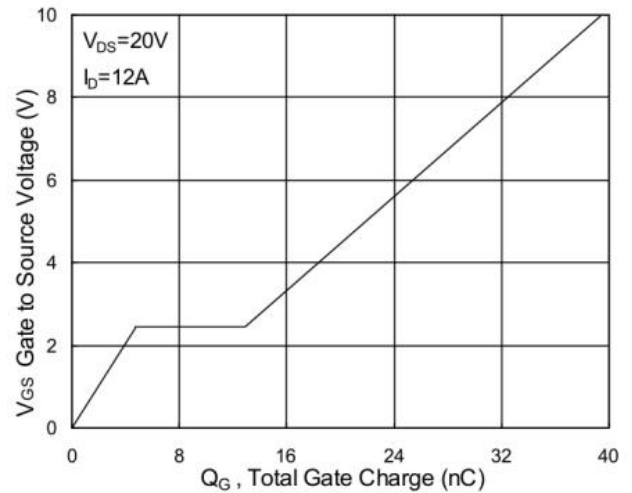


Fig.4 Gate-Charge Characteristics

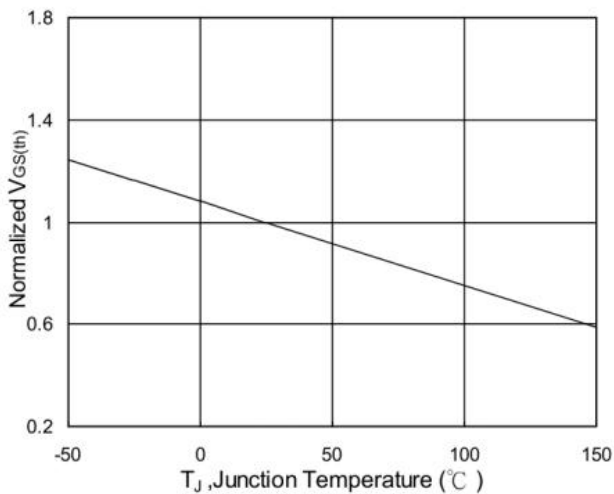


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

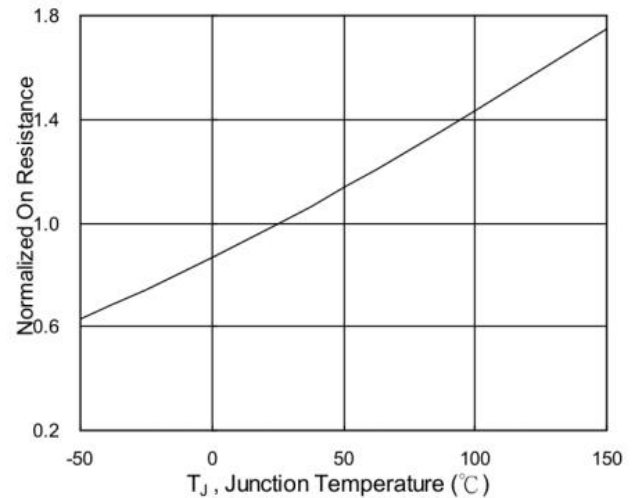


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

40V N-Channel Enhancement Mode MOSFET

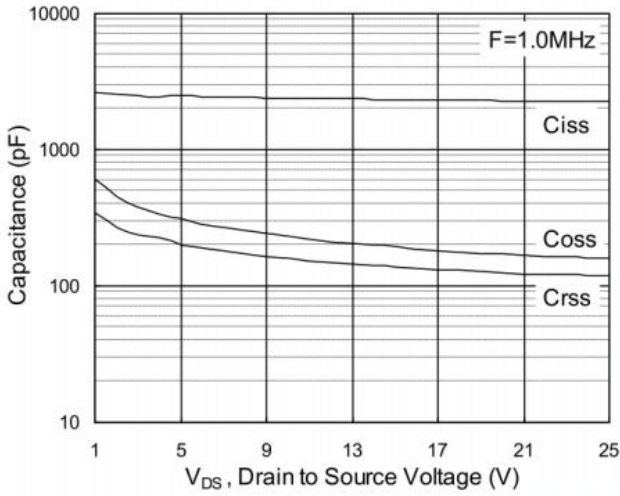


Fig.7 Capacitance

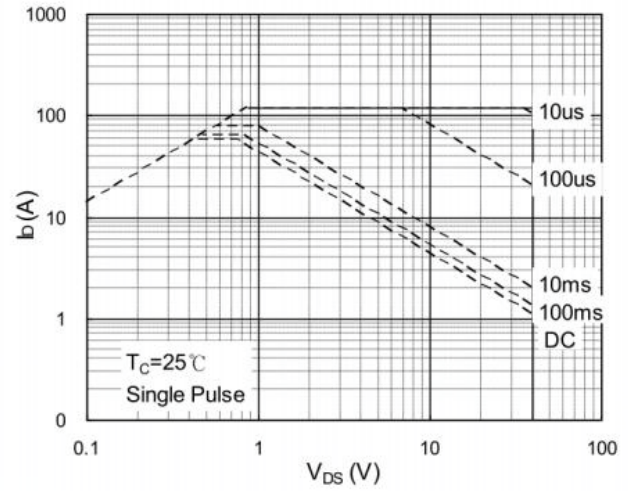


Fig.8 Safe Operating Area

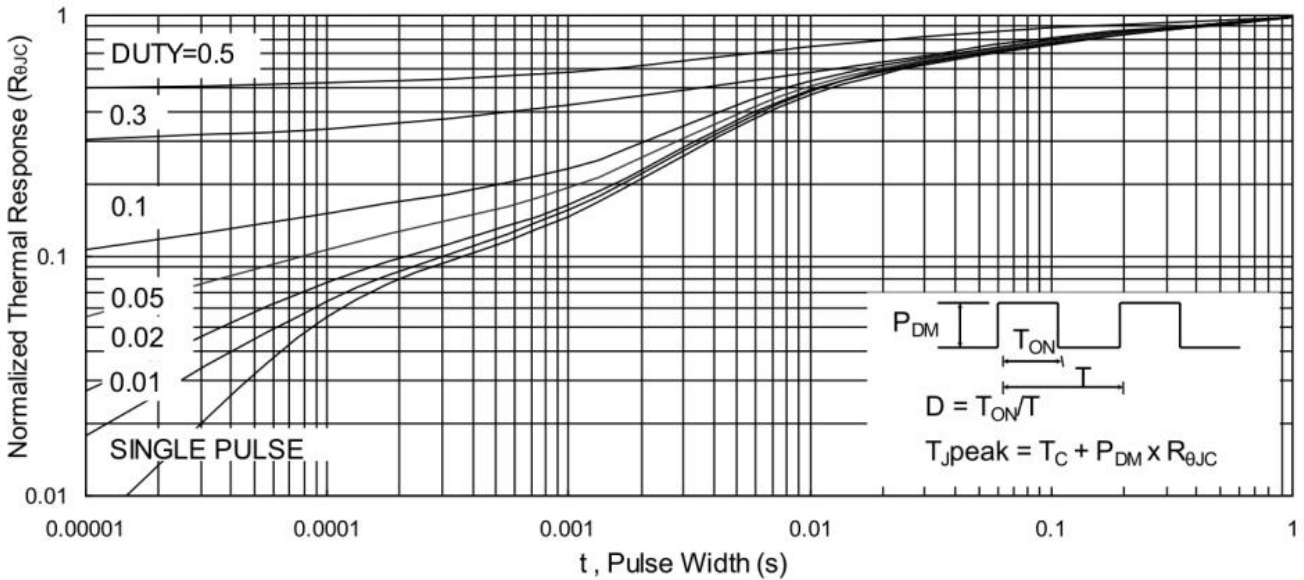


Fig.9 Normalized Maximum Transient Thermal Impedance

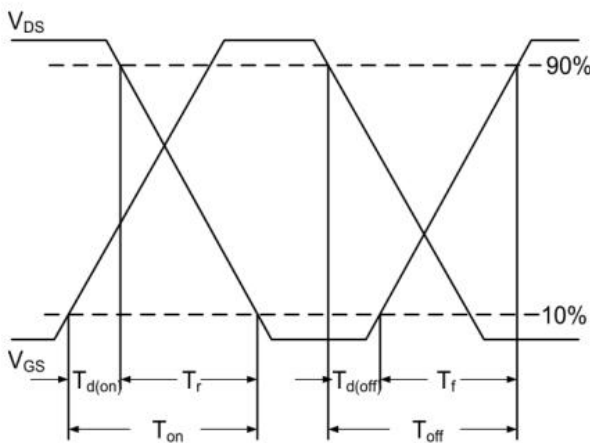


Fig.10 Switching Time Waveform

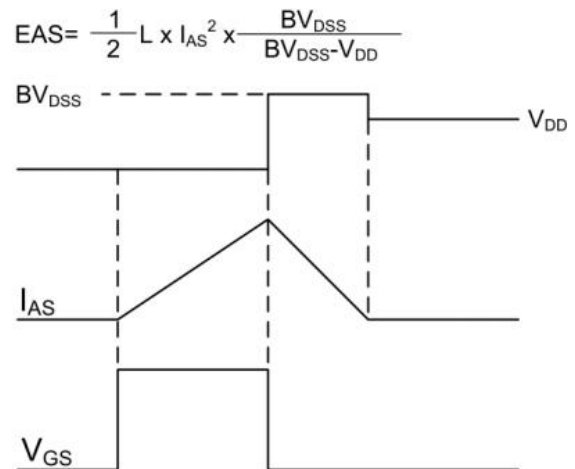
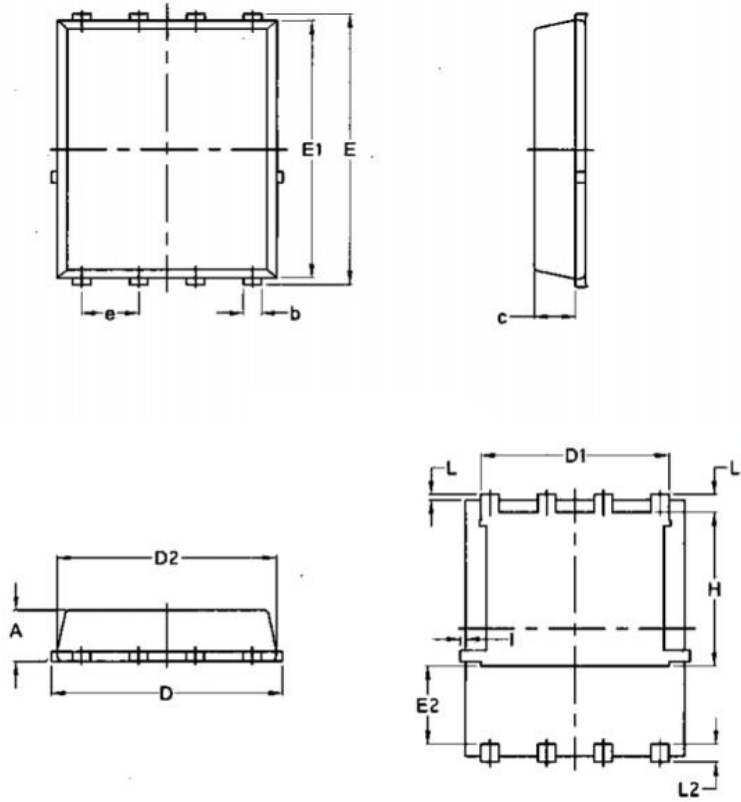


Fig.11 Unclamped Inductive Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

40V N-Channel Enhancement Mode MOSFET

Package Mechanical Data-PDFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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