

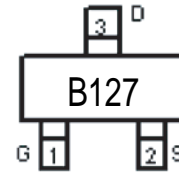
N-Channel Enhancement Mode Power MOSFET

Description

This new generation uses advanced planar technology MOSFET, provide excellent high voltage and fast switching, making it ideal for small-signal and level shift applications.



Schematic diagram



Marking and pin assignment



SOT-23 top view

Features

- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage

Application

- Motor Control
- DC-DC Converters
- Power management
- Backlighting
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g: BSS127V

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
B127	BSS127	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_A = 25^\circ\text{C}$	0.021
		$T_A = 70^\circ\text{C}$	0.017
Drain Current -Pulsed (Note 1)	I_{DM}	0.09	A
Maximum Power Dissipation	P_D	0.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	250	$^\circ\text{C/W}$
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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	600	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	-	-	0.1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	±10	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =8 μA	1.4	2.0	2.6	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =0.016A	-	310	500	Ω
		V _{GS} =4.5V, I _D =0.016A	-	330	600	
Forward Transconductance	g _{FS}	V _{DS} >2 I _D R _{DS(ON)} MAX I _D =0.01A	0.007	0.015	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	21	28	PF
Output Capacitance	C _{oss}		-	2.4	3	PF
Reverse Transfer Capacitance	C _{rss}		-	1.0	1.5	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =300V, I _D =0.01A V _{GS} =10V, R _{GEN} =6Ω	-	6.1	19	nS
Turn-on Rise Time	t _r		-	9.7	14.5	nS
Turn-Off Delay Time	t _{d(off)}		-	14	21	nS
Turn-Off Fall Time	t _f		-	115	170	nS
Total Gate Charge	Q _g	V _{DS} =300V, I _D =0.01A, V _{GS} =10V	-	0.07	0.10	nC
Gate-Source Charge	Q _{gs}		-	0.31	0.5	nC
Gate-Drain Charge	Q _{gd}		-	0.65	1.0	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =0.016A	-	0.82	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	0.016	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

RATING AND CHARACTERISTICS CURVES (BSS127V)

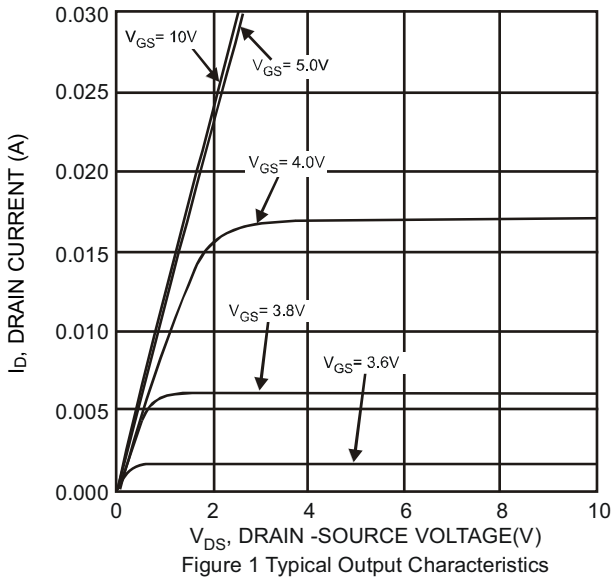


Figure 1 Typical Output Characteristics

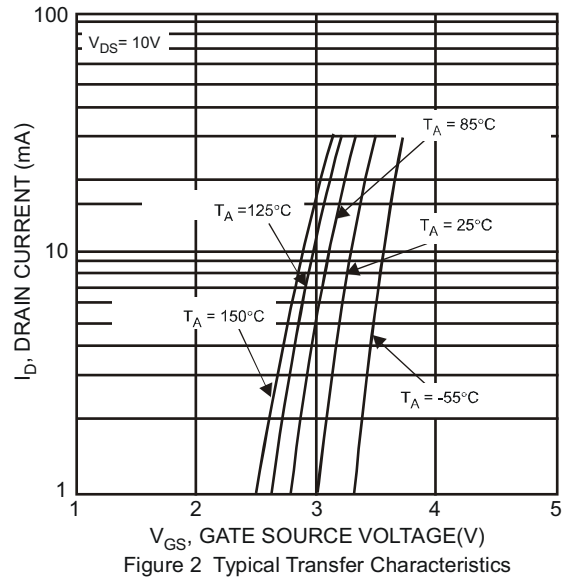


Figure 2 Typical Transfer Characteristics

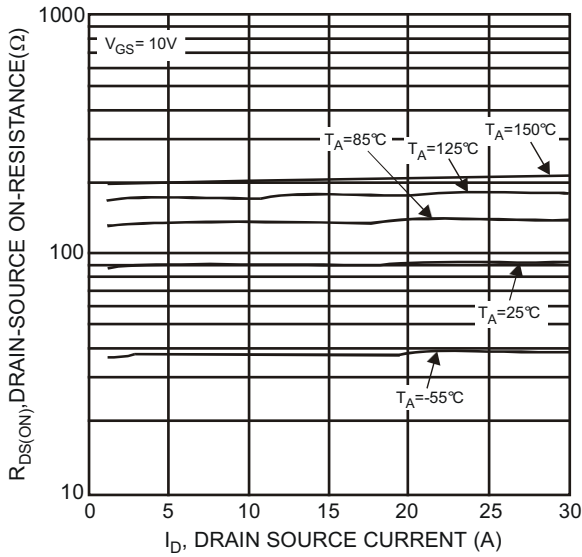


Figure 3 Typical On-Resistance vs. Drain Current and Temperature

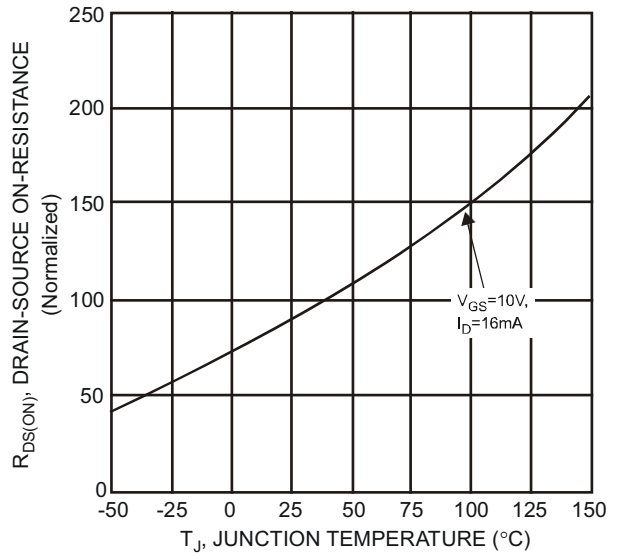


Figure 4 On-Resistance Variation with Temperature

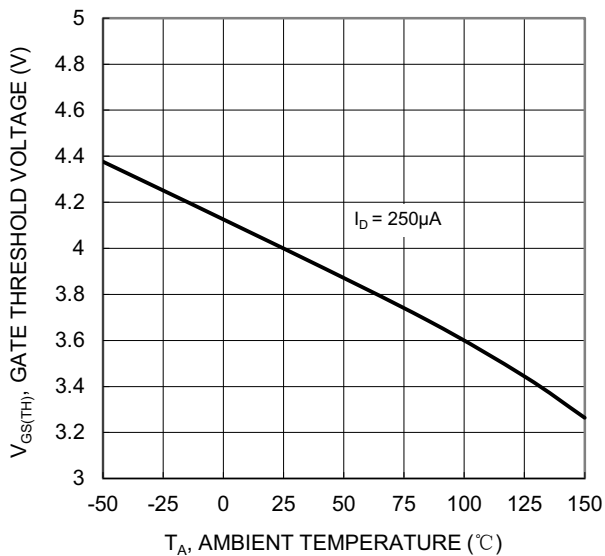


Figure 5. Gate Threshold Variation vs. Ambient Temperature

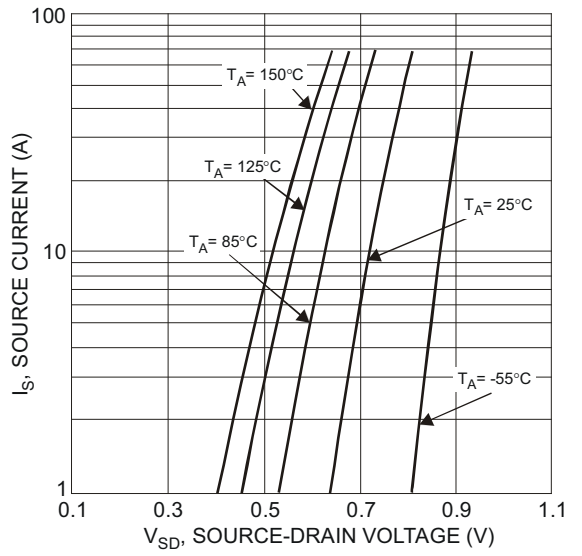


Figure 6 Diode Forward Voltage vs. Current

RATING AND CHARACTERISTICS CURVES (BSS127V)

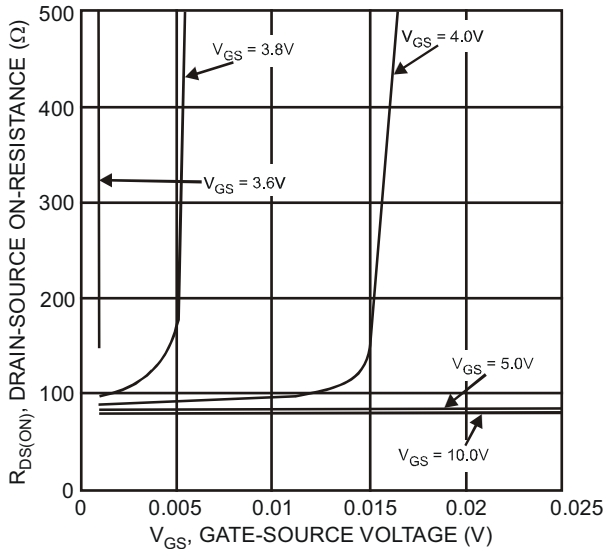


Figure 7 Typical On-Resistance vs. Drain Current and Gate Voltage

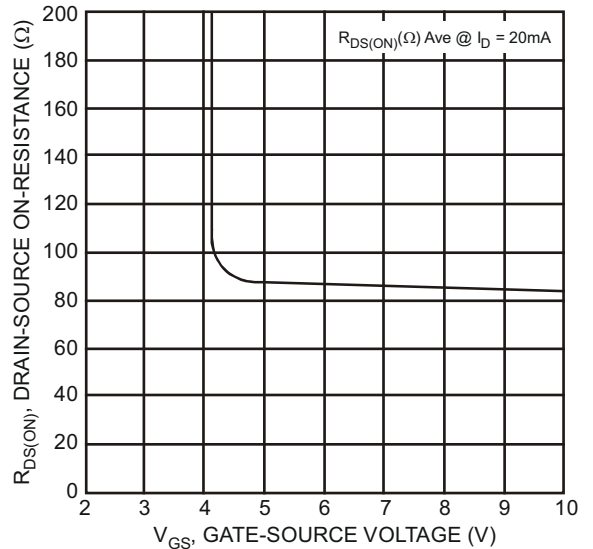


Figure 8 Typical Transfer Characteristic

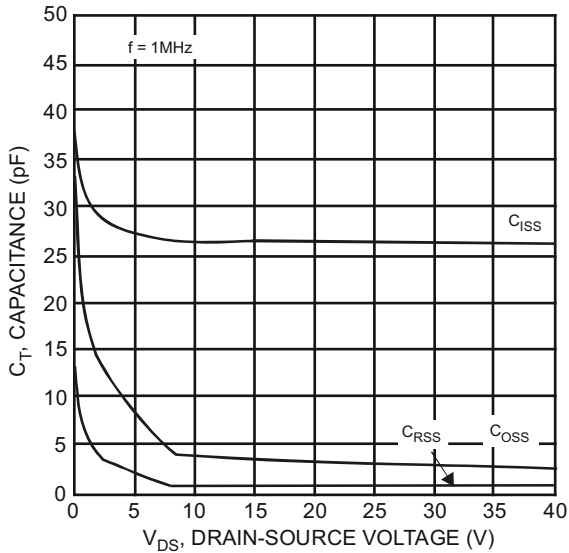


Figure 9 Typical Junction Capacitance

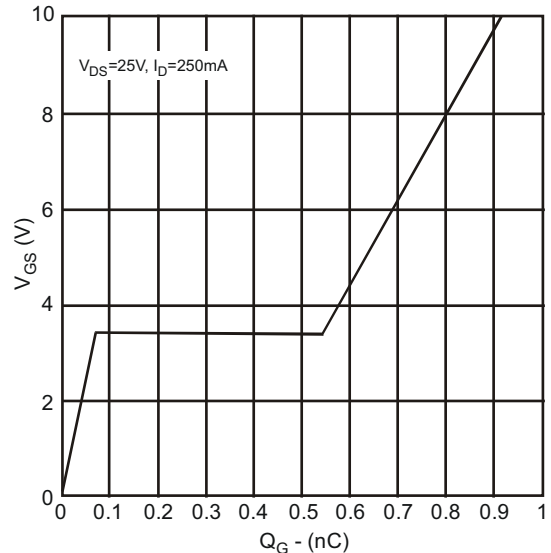


Figure 10 Gate Charge Characteristics

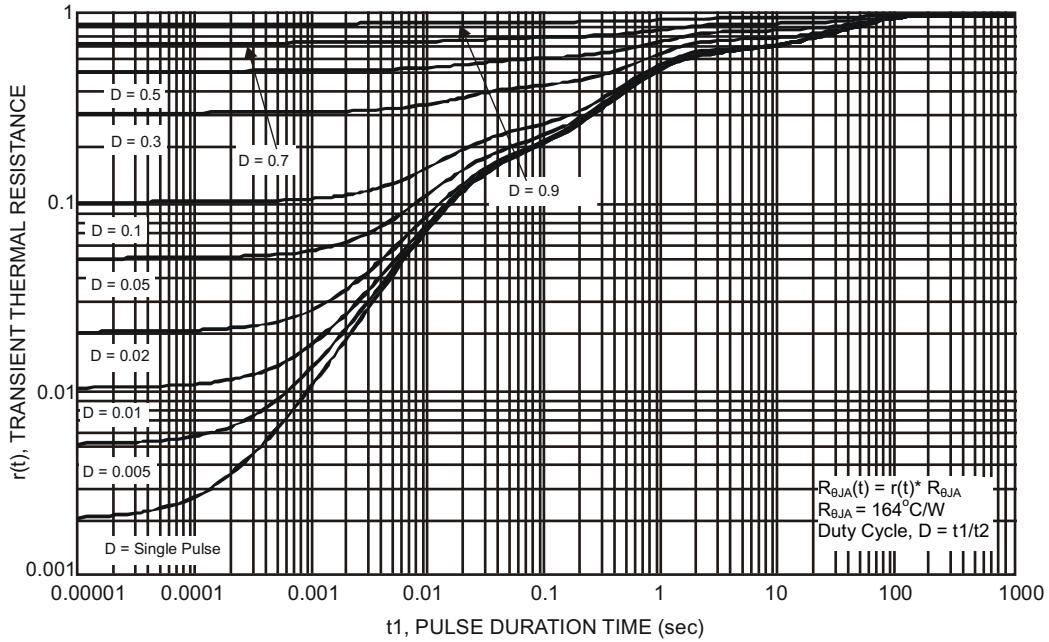
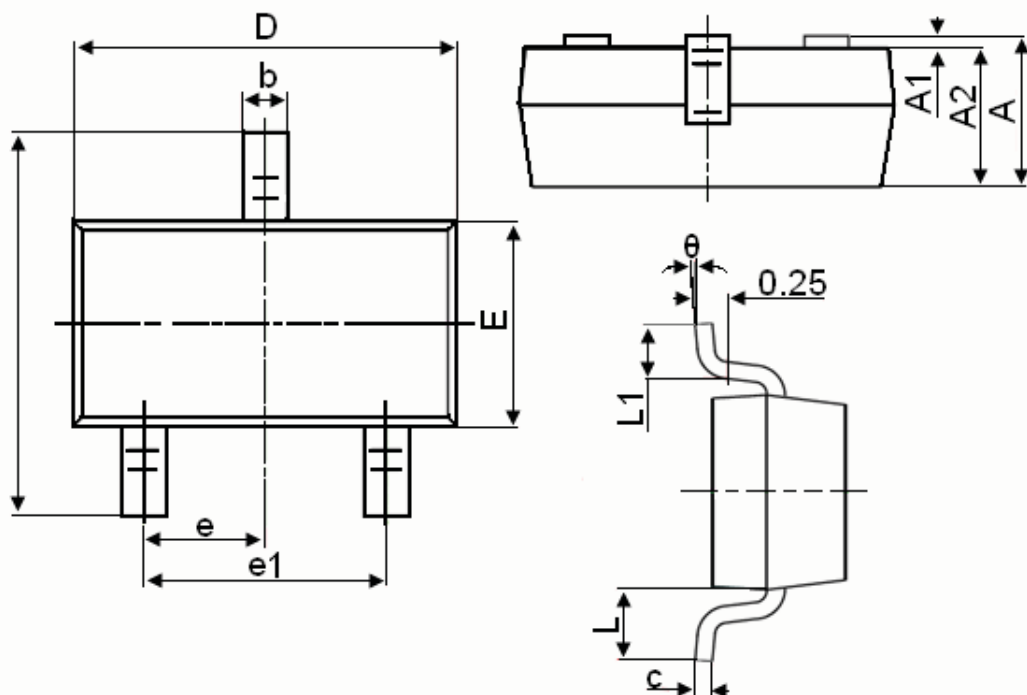


Figure 11 Transient Thermal Resistance

SOT-23 Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Notes

- All dimensions are in millimeters.
- Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
- Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
- Dimension L is measured in gauge plane.
- Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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