

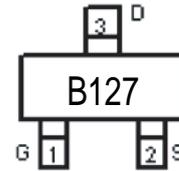
N-Channel Enhancement Mode Power MOSFET

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

Package Marking and Ordering Information

Device Marking	Device	Device Package	Packaging Code	Reel Size	Quantity(PCS)
B127	BSS127	SOT-23	-T	7inch	3000

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$	-	-	0.1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	± 10	± 100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=8\mu A$	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	$t_{d(on)}$	$V_{DD}=300V, I_D=0.01A$ $V_{GS}=10V, R_{GEN}=6\Omega$	-	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, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

RATING AND CHARACTERISTICS CURVES (BSS127)

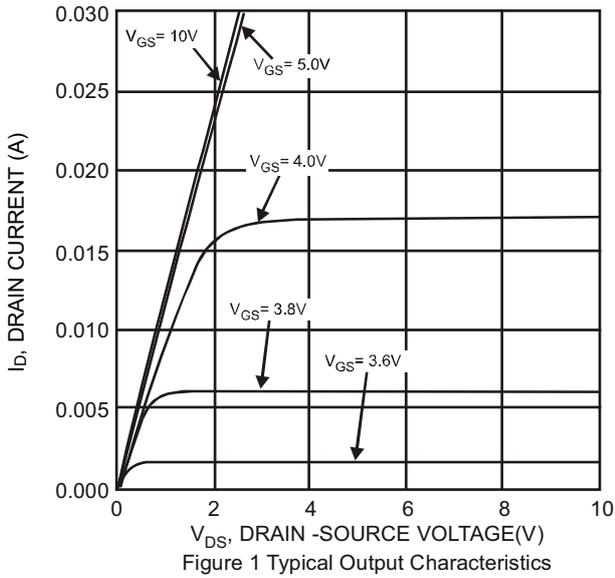


Figure 1 Typical Output Characteristics

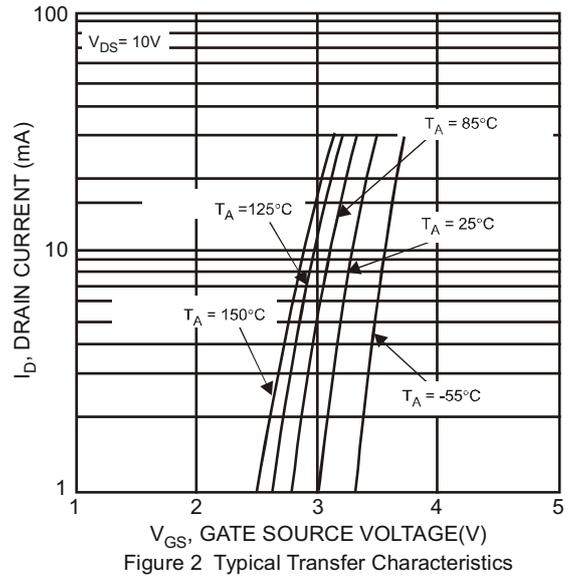


Figure 2 Typical Transfer Characteristics

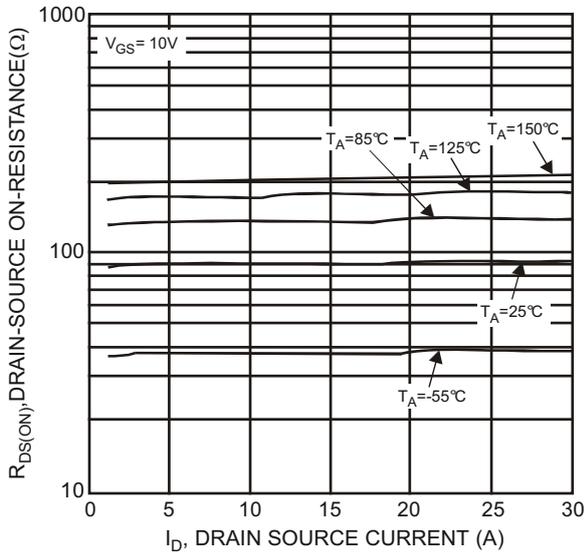


Figure 3 Typical On-Resistance vs. Drain Current and Temperature

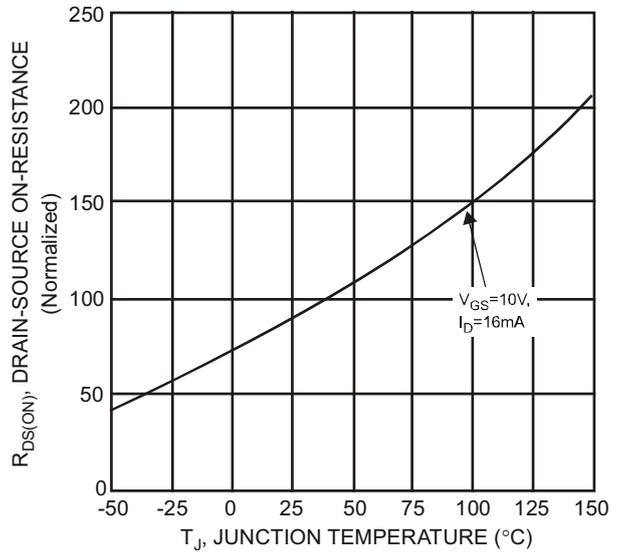


Figure 4 On-Resistance Variation with Temperature

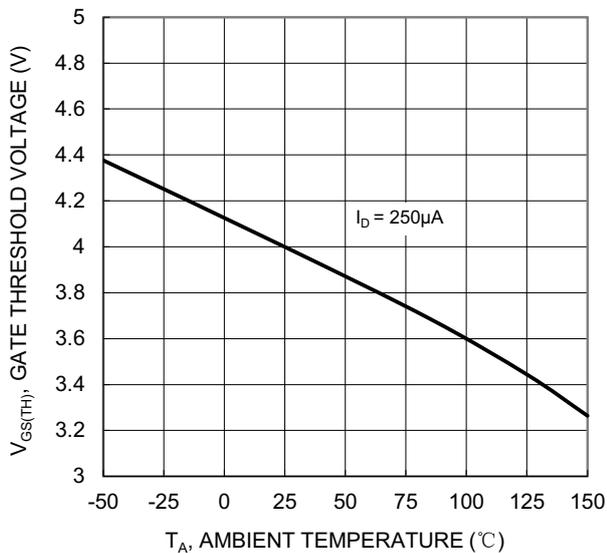


Figure 5. Gate Threshold Variation vs. Ambient Temperature

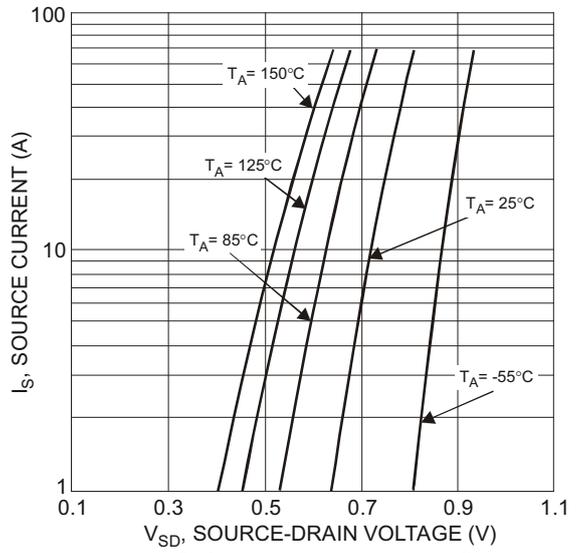


Figure 6 Diode Forward Voltage vs. Current

RATING AND CHARACTERISTICS CURVES (BSS127)

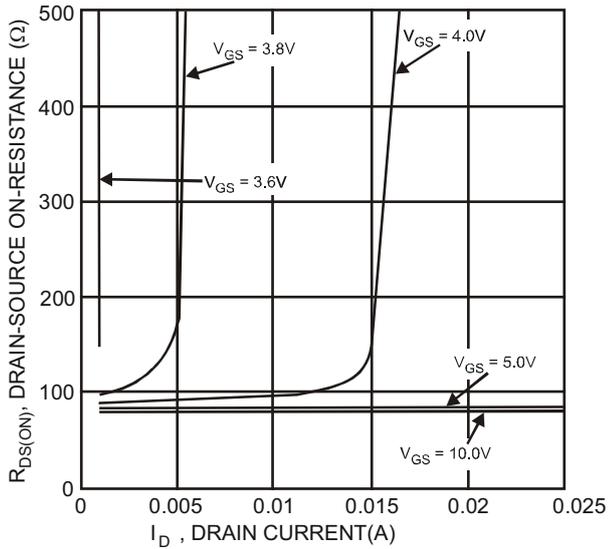


Figure 7 Typical On-Resistance vs. Drain Current and Gate Voltage

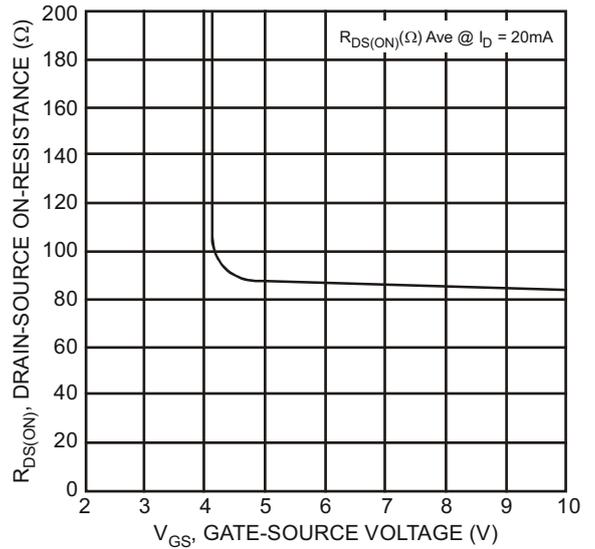


Figure 8 Typical Transfer Characteristic

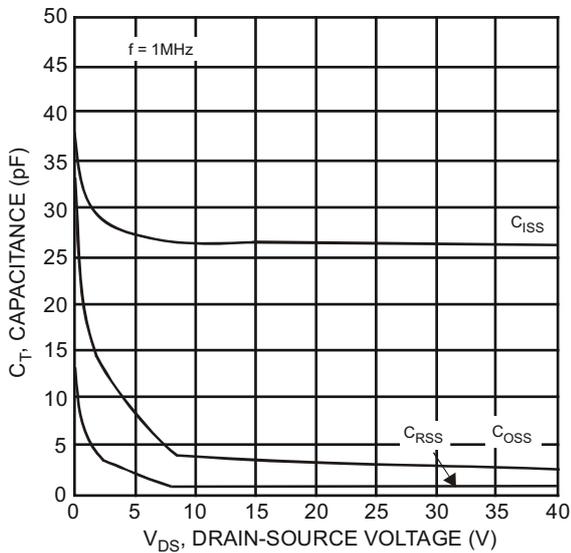


Figure 9 Typical Junction Capacitance

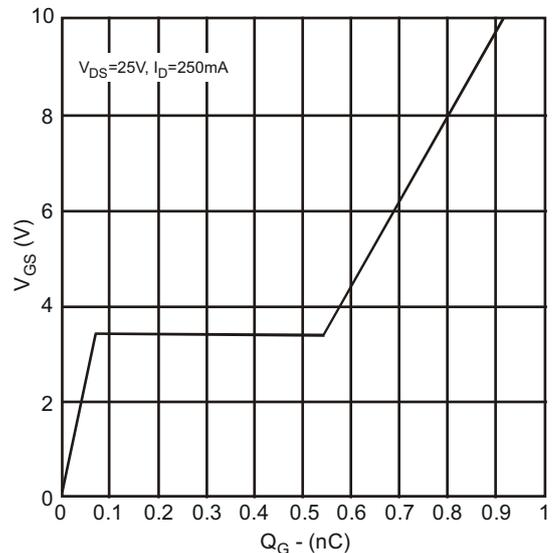


Figure 10 Gate Charge Characteristics

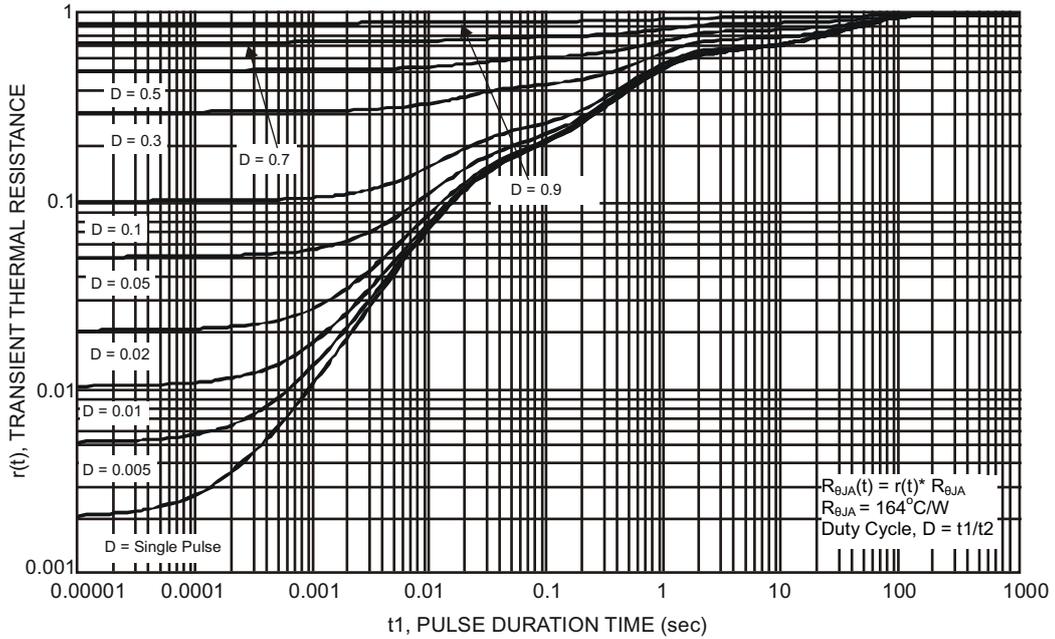
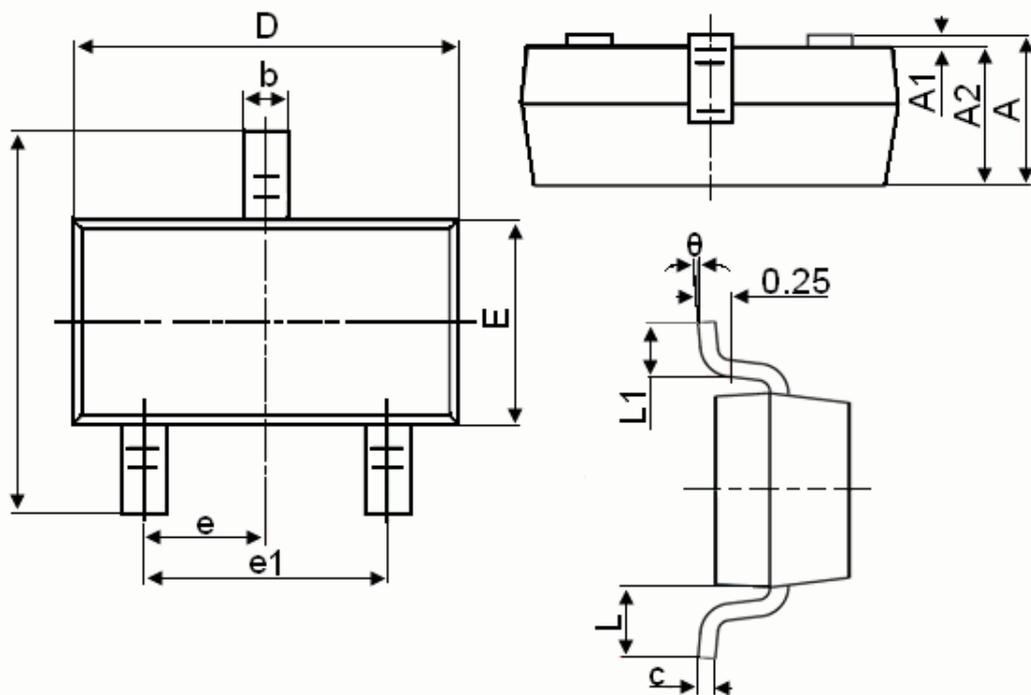


Figure 11 Transient Thermal Resistance

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

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

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