

Product Summary

V _{(BR)DSS}	R _{D(on)TYP}	I _D
85V	1.8mΩ@10V	200A


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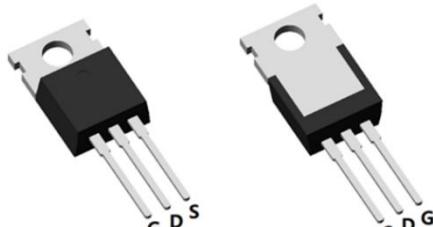
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

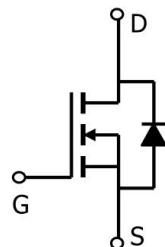
- Power switching application
- DC-DC Converter
- Power Management

Package

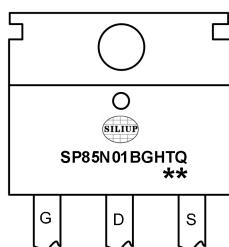


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP85N01BGHTQ	TO-220-3L	50

SP85N01BGHTQ : Product code
** : Week code

Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V _{DS}	85	V	
Gate-Source Voltage	V _{GS}	±20	V	
Continuous Drain Current (Tc=25°C)	Silicon limit	I _D	280	A
Continuous Drain Current (Tc=25°C)	Package limit	I _D	200	A
Continuous Drain Current (Tc=100°C)	I _D	130	A	
Pulsed Drain Current	I _{DM}	800	A	
Single Pulse Avalanche Energy ¹	E _{AS}	529	mJ	
Power Dissipation (Tc=25°C)	P _D	270	W	
Thermal Resistance Junction-to-Case	R _{θJC}	0.46	°C/W	
Storage Temperature Range	T _{STG}	-55 to 150	°C	
Operating Junction Temperature Range	T _J	-55 to 150	°C	

Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , ID=250uA	85	-	-	V
Drain Cut-Off Current	I _{DSS}	V _{DS} =68V , V _{GS} =0V , TJ=25°C	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =±20V , V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , ID =250uA	2.0	3.0	4.0	V
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V , ID=20A	-	1.8	2.25	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	VDS=40V , VGS=0V , f=1MHz	-	8750	-	pF
Output Capacitance	C _{oss}		-	1750	-	
Reverse Transfer Capacitance	C _{rss}		-	25	-	
Total Gate Charge	Q _g	VDS=40V , VGS=10V , ID=125A	-	126	-	nC
Gate-Source Charge	Q _{gs}		-	41	-	
Gate-Drain Charge	Q _{gd}		-	25	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	VDD=40V, VGS=10V , RG=1.6Ω, ID=125A	-	36	-	nS
Rise Time	t _r		-	38	-	
Turn-Off Delay Time	t _{d(off)}		-	90	-	
Fall Time	t _f		-	45	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S	I _S =50A, di/dt=100A/us, TJ=25°C	-	-	200	A
Reverse Recovery Time	T _{rr}		-	106	-	nS
Reverse Recovery Charge	Q _{rr}		-	156	-	nC

Note:

1. The EAS test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω



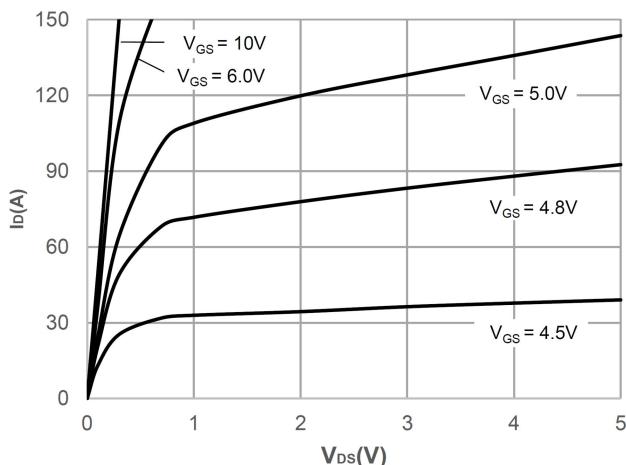
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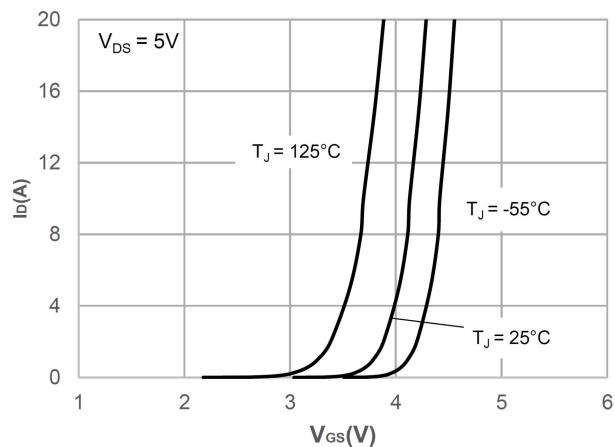
Typical Characteristics

SP85N01BGHTQ

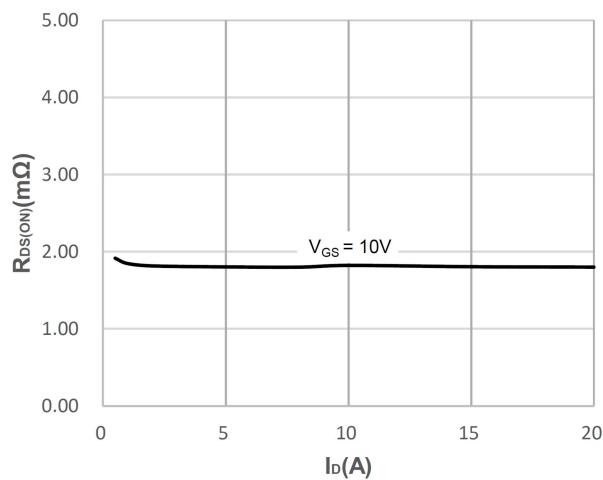
85V N-Channel Power MOSFET



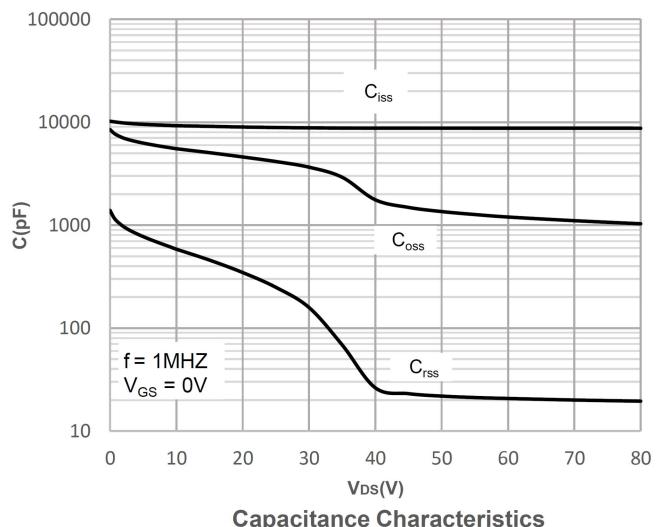
Output Characteristics



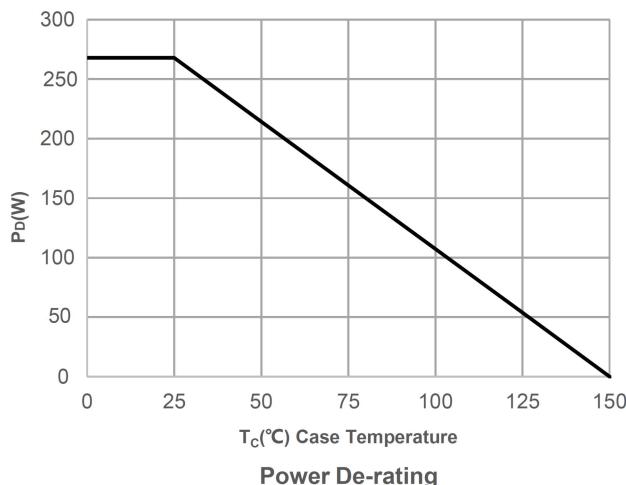
Typical Transfer Characteristics



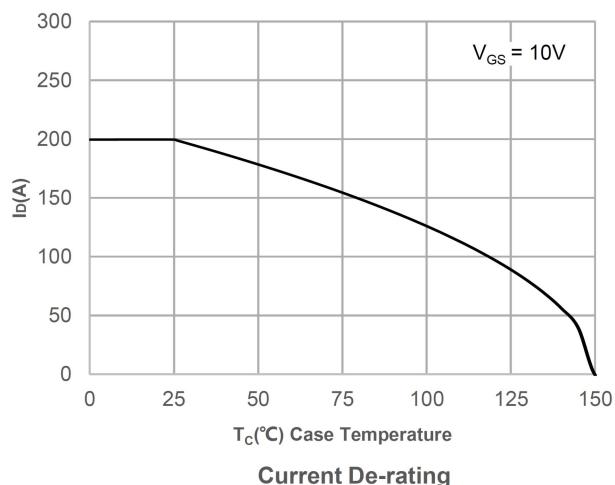
On-resistance vs. Drain Current



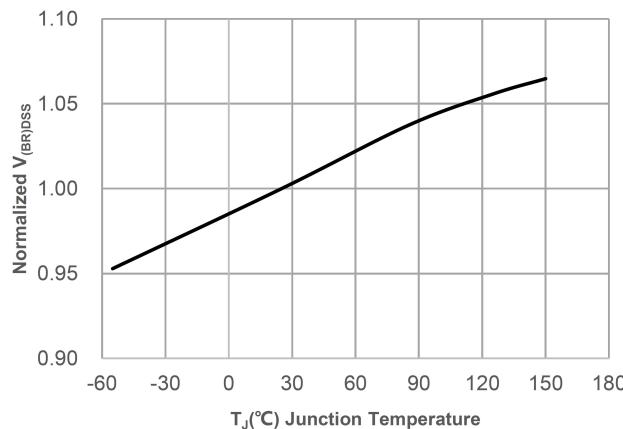
Capacitance Characteristics



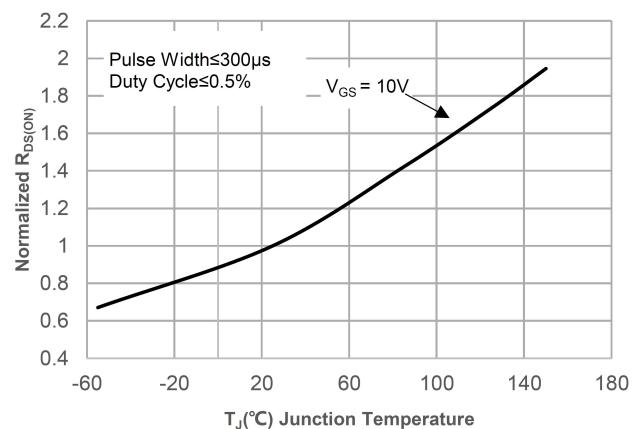
Power De-rating



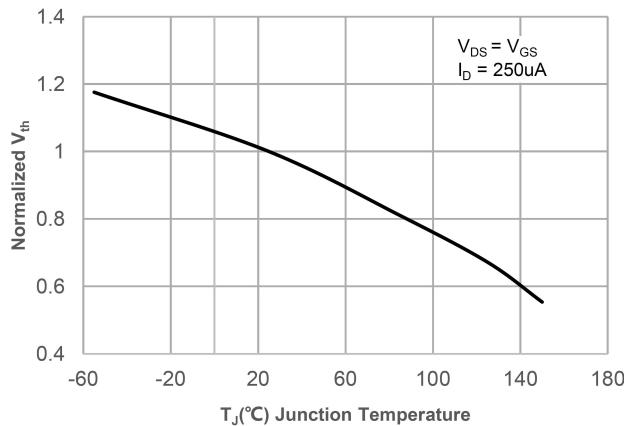
Current De-rating



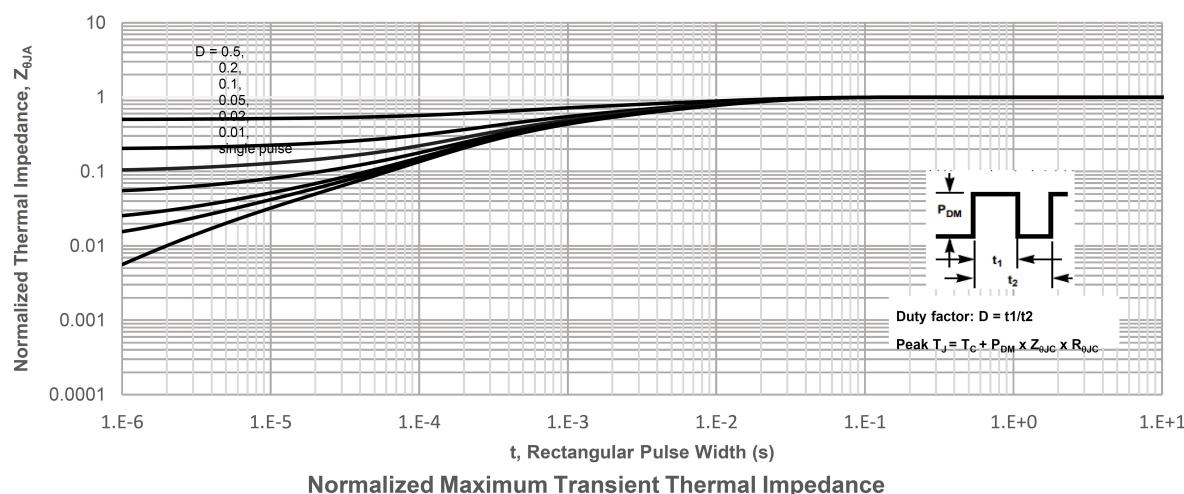
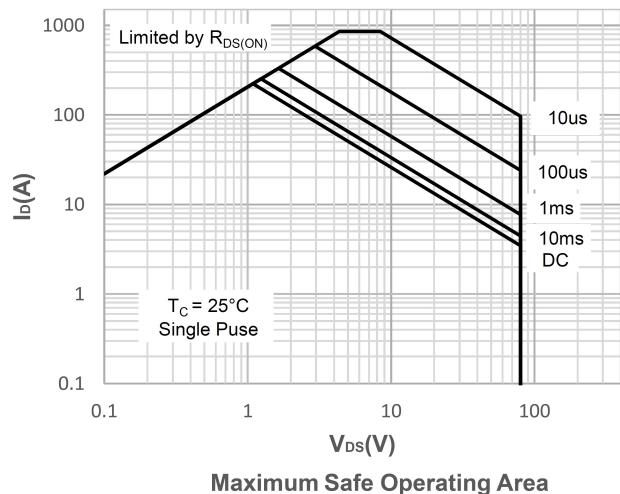
Normalized Breakdown voltage vs. Junction Temperature



Normalized on Resistance vs. Junction Temperature



Normalized Threshold Voltage vs. Junction Temperature





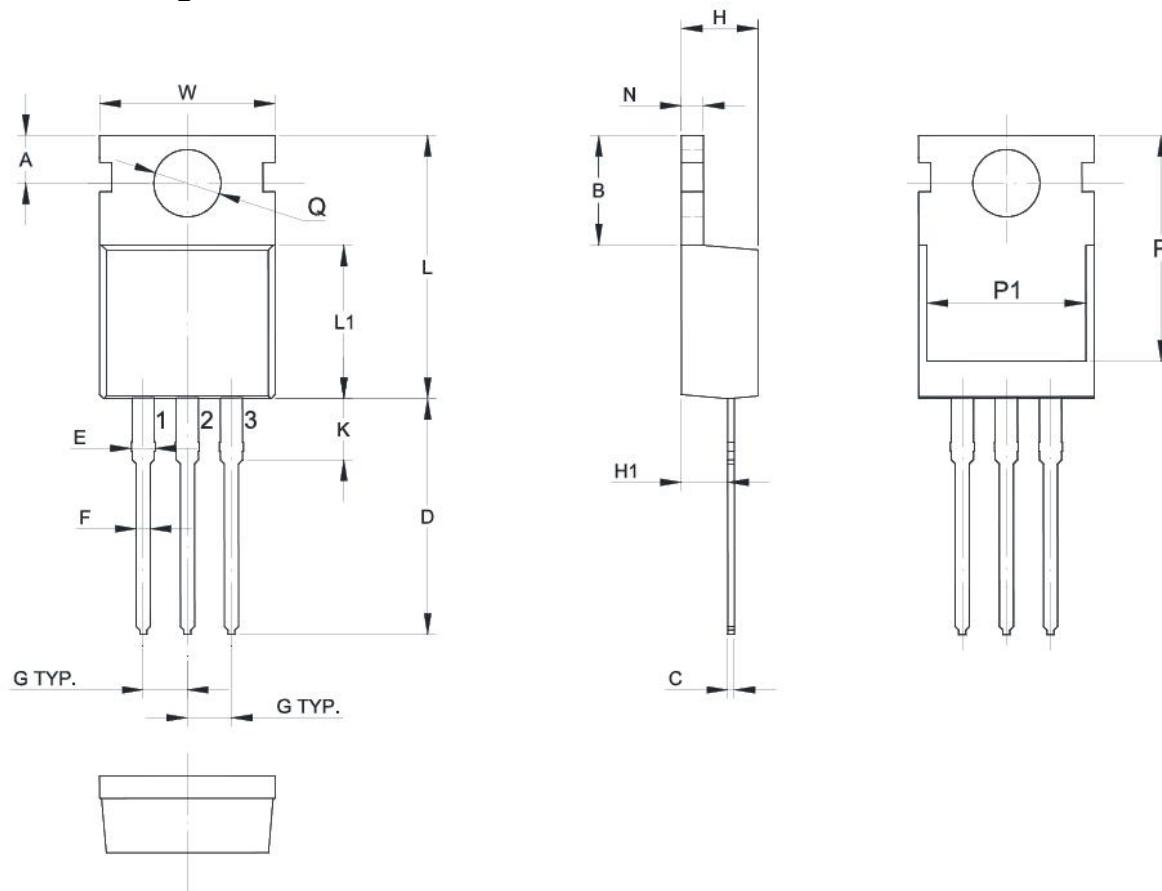
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TO-220-3L Package Information

SP85N01BGHTQ

85V N-Channel Power MOSFET



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	2.700	2.900
B	6.400	6.800
C	0.300	0.700
D	11	15
E	1.1	1.5
F	0.7	0.9
G	2.54TYP	
W	9.8	10.2
H	4.3	4.7
H1	2.2	2.5
K	2.7	3.1
L	14.8	16.8
L1	9.0	9.4
N	1.2	1.4
P	12.7	13.3
P1	7.6	8.2
Q	3.5	3.7