

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
85V	1.8mΩ@10V	200A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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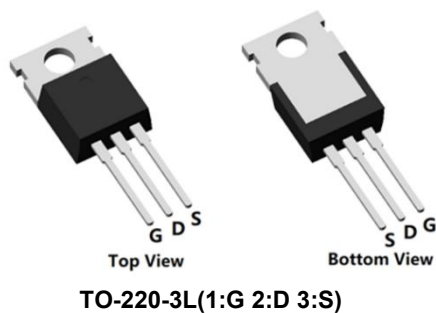
Feature

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

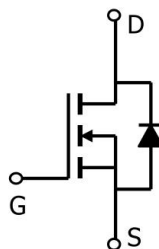
Applications

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

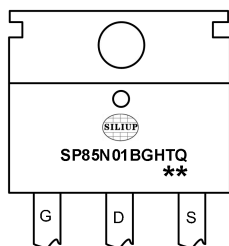
Package



Circuit diagram



Marking



SP85N01BGHTQ : Product code
****** : Week code

Order Information

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

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		$R_{\theta JC}$	0.46	°C/W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

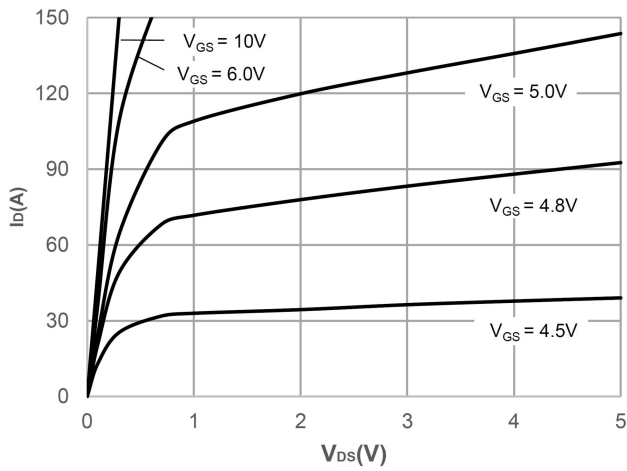
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	85	-	-	V
Drain Cut-Off Current	IDSS	VDS=68V , VGS=0V , TJ=25℃	-	-	1	μA
Gate Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	2.0	3.0	4.0	V
Drain-Source ON Resistance	RDS(ON)	VGS=10V , ID=20A	-	1.8	2.25	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS=40V , VGS=0V , f=1MHz	-	8750	-	pF
Output Capacitance	Coss		-	1750	-	
Reverse Transfer Capacitance	Crss		-	25	-	
Total Gate Charge	Qg	VDS=40V , VGS=10V , ID=125A	-	126	-	nC
Gate-Source Charge	Qgs		-	41	-	
Gate-Drain Charge	Qgd		-	25	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=40V, VGS=10V , RG=1.6Ω, ID=125A	-	36	-	nS
Rise Time	tr		-	38	-	
Turn-Off Delay Time	td(off)		-	90	-	
Fall Time	tf		-	45	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	IS = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	200	A
Reverse Recovery Time	Trr	IS=50A, di/dt=100A/us, TJ=25℃	-	106	-	nS
Reverse Recovery Charge	Qrr		-	156	-	nC

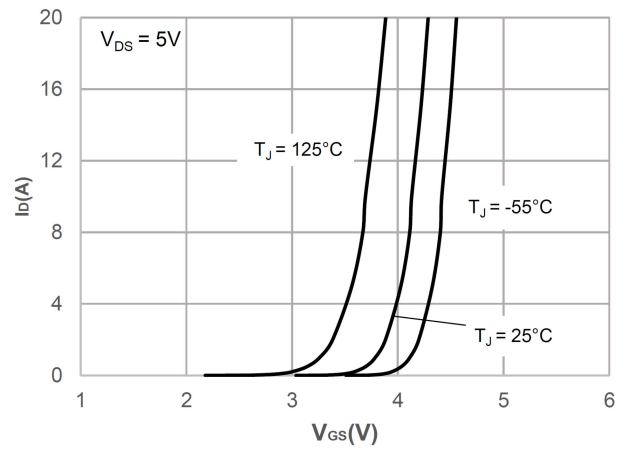
Note:

- The EAS test condition is $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

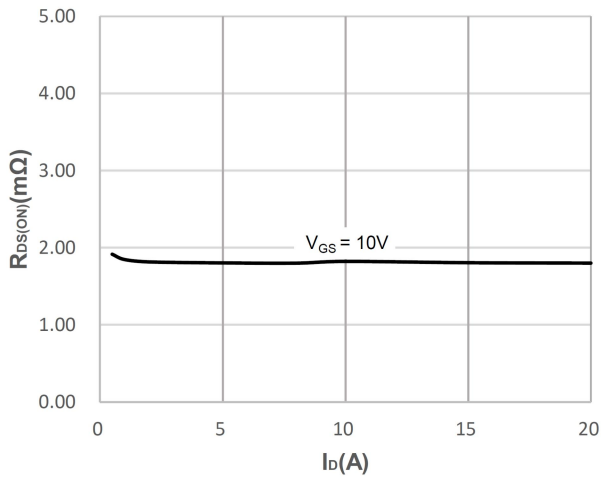
Typical Characteristics



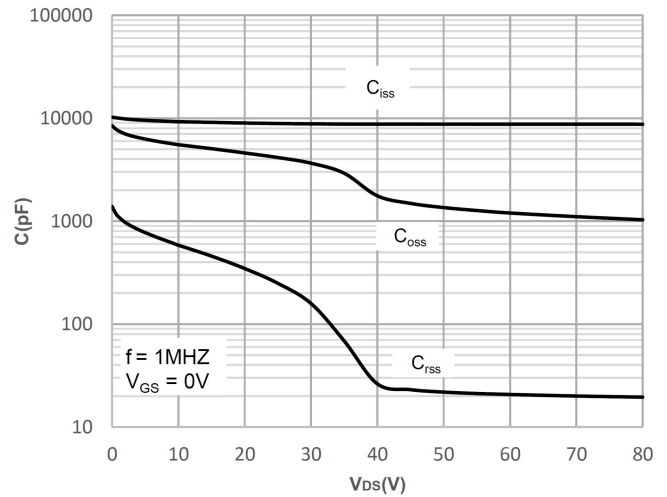
Output Characteristics



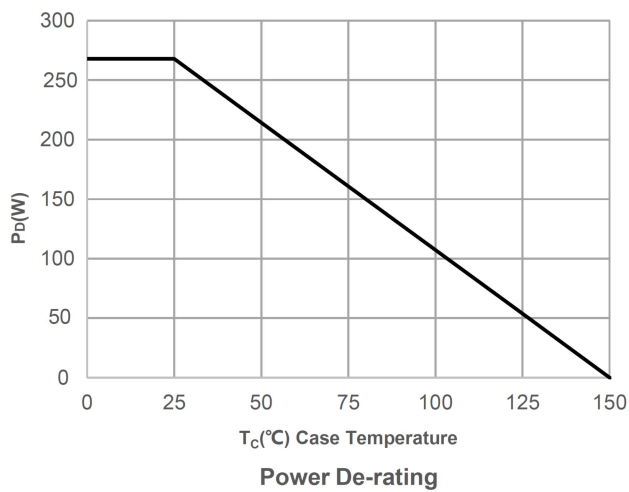
Typical Transfer Characteristics



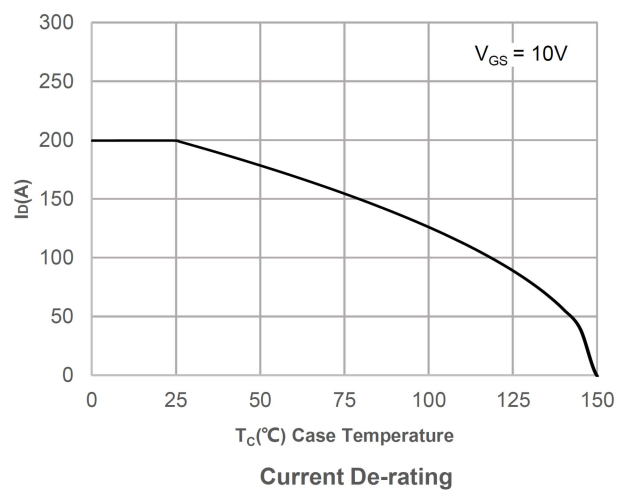
On-resistance vs. Drain Current



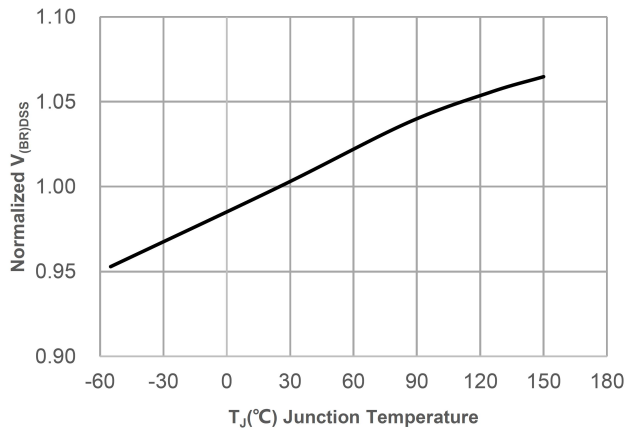
Capacitance Characteristics



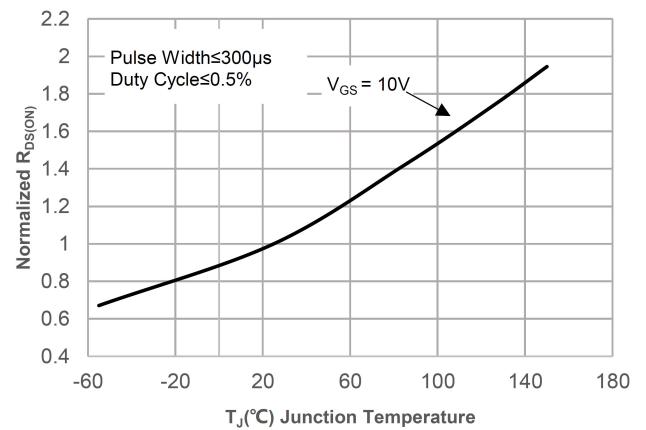
Power De-rating



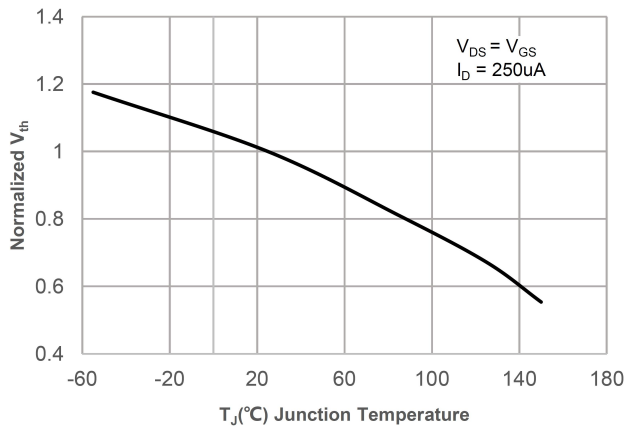
Current De-rating



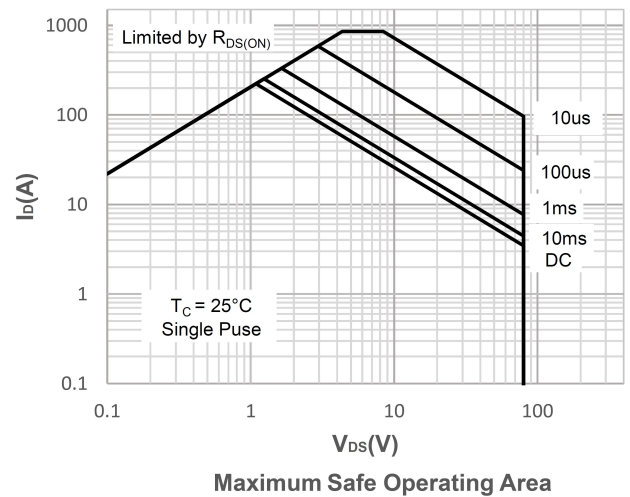
Normalized Breakdown voltage vs. Junction Temperature



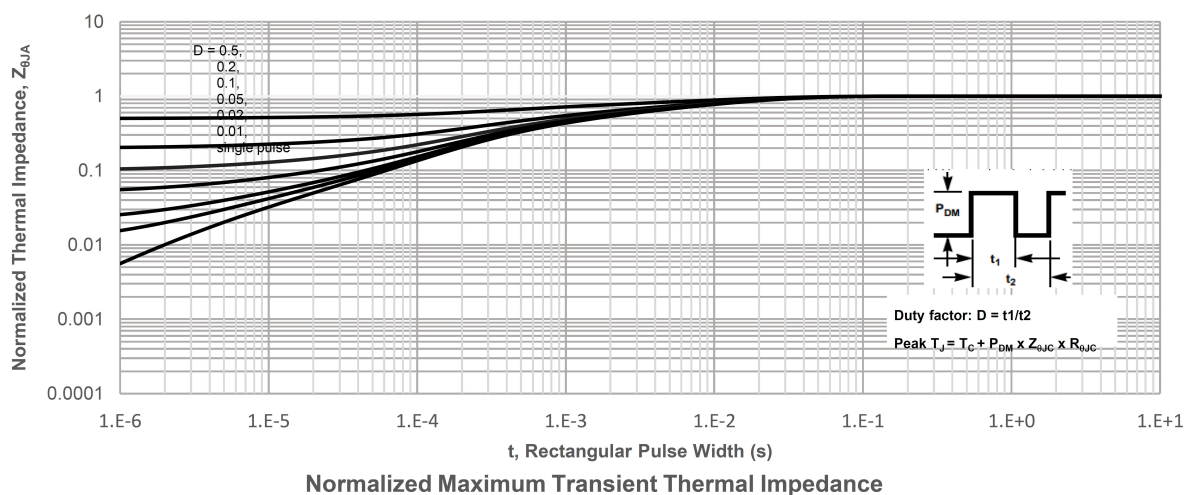
Normalized on Resistance vs. Junction Temperature

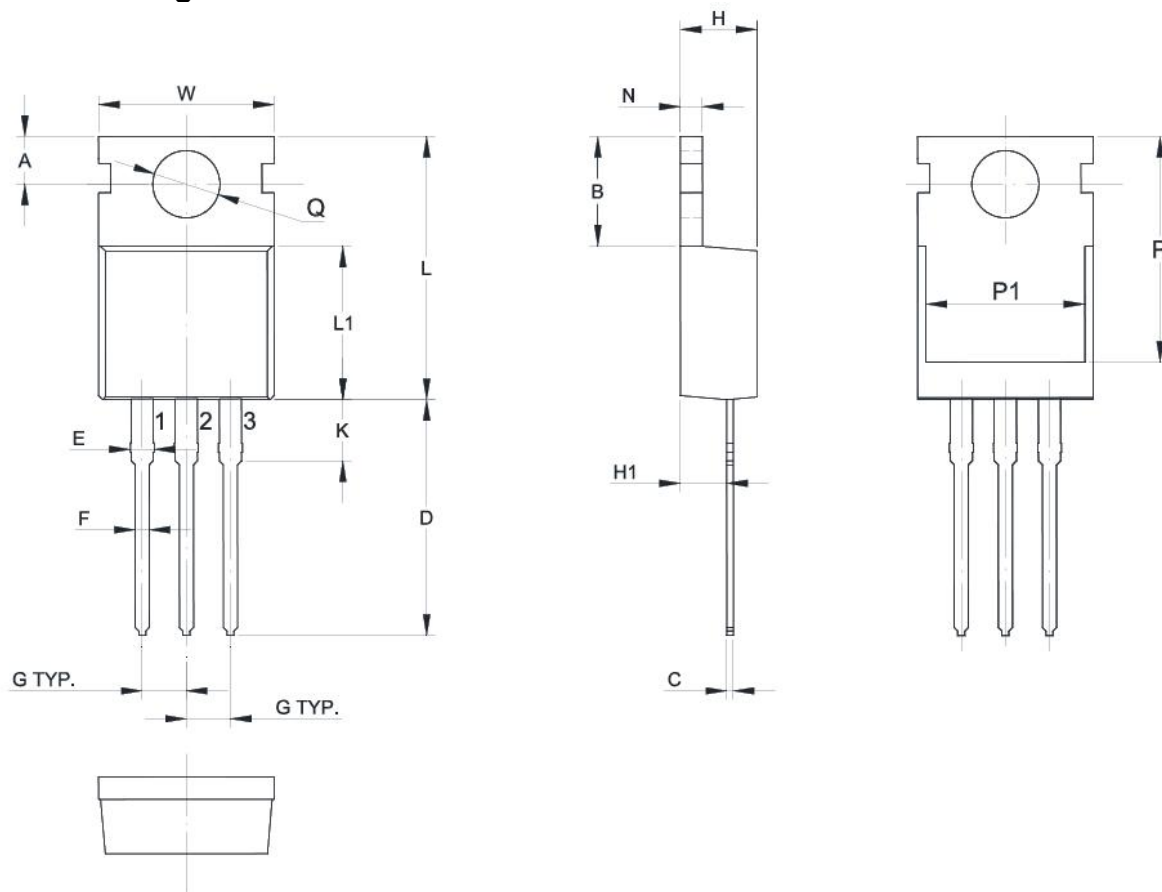


Normalized Threshold Voltage vs. Junction Temperature



Maximum Safe Operating Area



TO-220-3L Package Information


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