SP85N04BHTQ

85V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
85V	4.9mΩ@10V	120A

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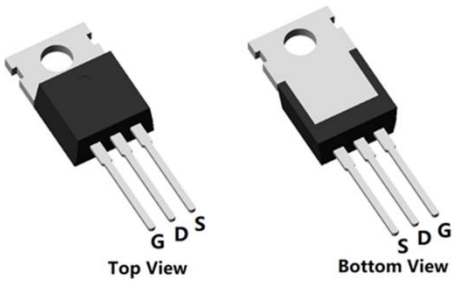
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Applications

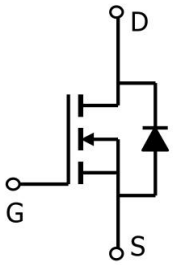
- Power switching application
- DC-DC Converter
- Power Management

Package

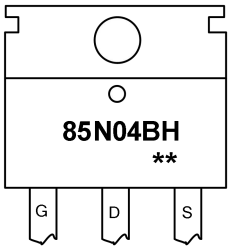


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



85N04BH :Product code
**** :Week code

Order Information

Device	Package	Unit/Tube
SP85N04BHTQ	TO-220-3L	50

Absolute maximum ratings (Ta=25℃,unless otherwise noted)

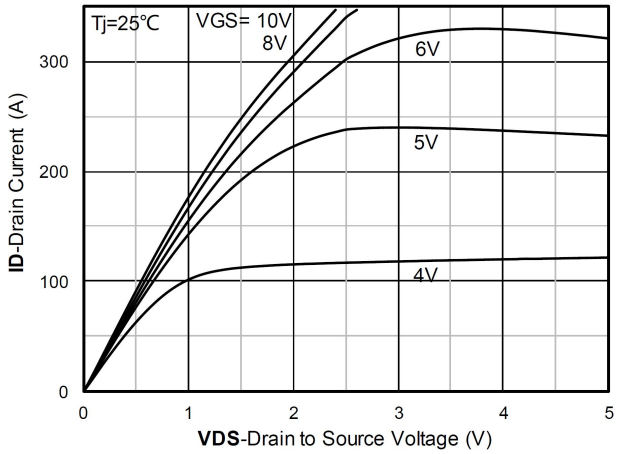
Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)	I_D	120	A
Continuous Drain Current (Tc=100℃)	I_D	90	A
Pulsed Drain Current	I_{DM}	480	A
Single Pulse Avalanche Energy[1]	E_{AS}	576	mJ
Power Dissipation (Tc=25℃)	P_D	180	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.7	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Electrical characteristics (Ta=25℃, unless otherwise noted)

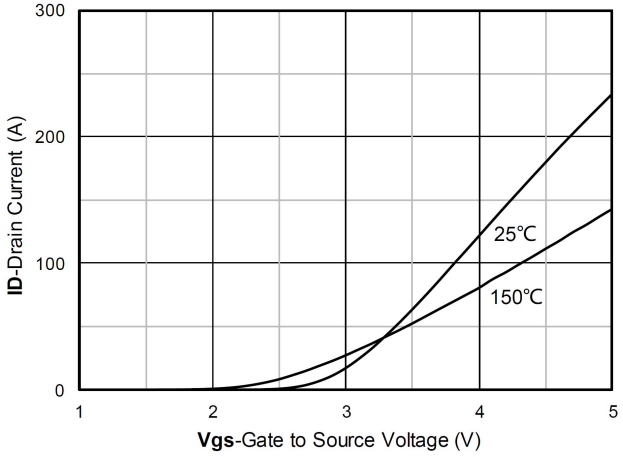
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	85	-	-	V
Drain Cut-Off Current	I_{DSS}	VDS=68V , VGS=0V , TJ=25℃	-	-	1	μA
Gate Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =250uA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=10V , ID=45A	-	4.9	6.2	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS=40V , VGS=0V , f=1MHz	-	4300	-	pF
Output Capacitance	C_{oss}		-	485	-	
Reverse Transfer Capacitance	C_{rss}		-	270	-	
Total Gate Charge	Q_g	VDS=68V , VGS=10V , ID=45A	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	14	-	
Gate-Drain Charge	Q_{gd}		-	17	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VDD=40V,VGS=10V,RG=6Ω,ID=45A	-	24	-	nS
Rise Time	t_r		-	50	-	
Turn-Off Delay Time	$t_{d(off)}$		-	120	-	
Fall Time	t_f		-	18	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	120	A
Reverse Recovery Time	Trr	I_S=45A, di/dt=100A/us, TJ=25℃	-	30	-	nS
Reverse Recovery Charge	Qrr		-	48	-	nC

Note :
1.The test condition is VDD=40V,VGS=10V,L=0.3mH,RG=25Ω

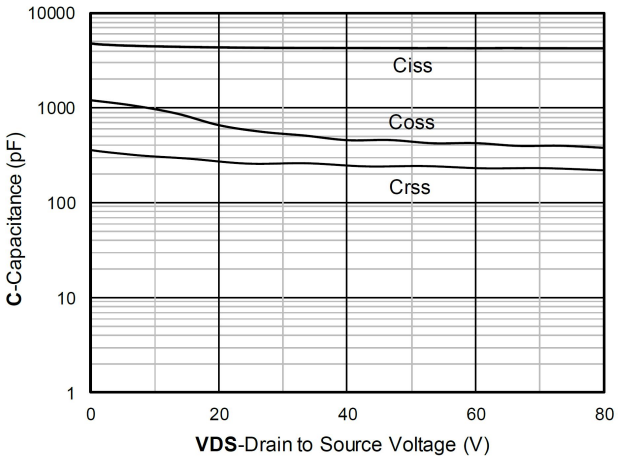
Typical Characteristics



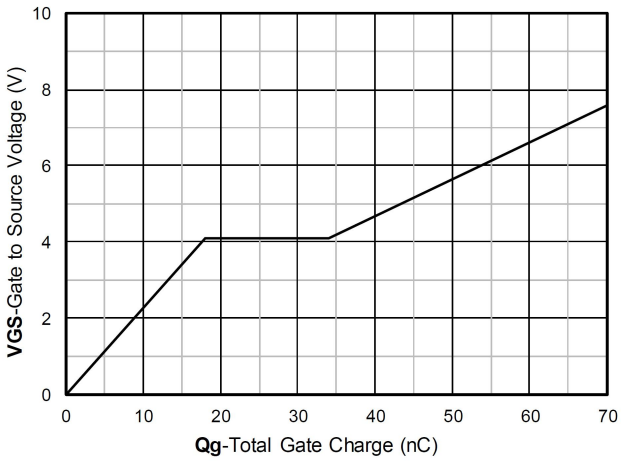
Output Characteristics



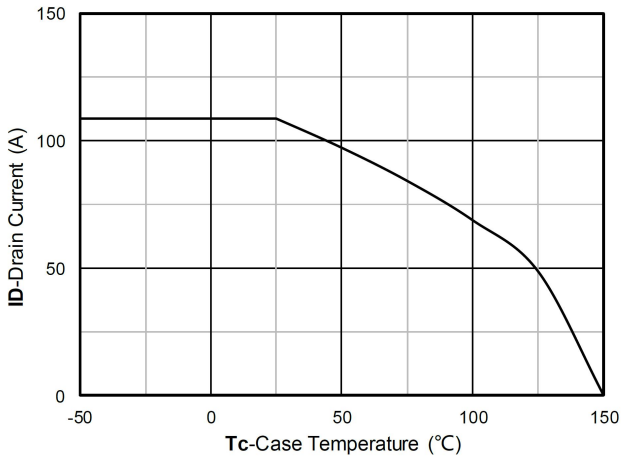
Transfer Characteristics



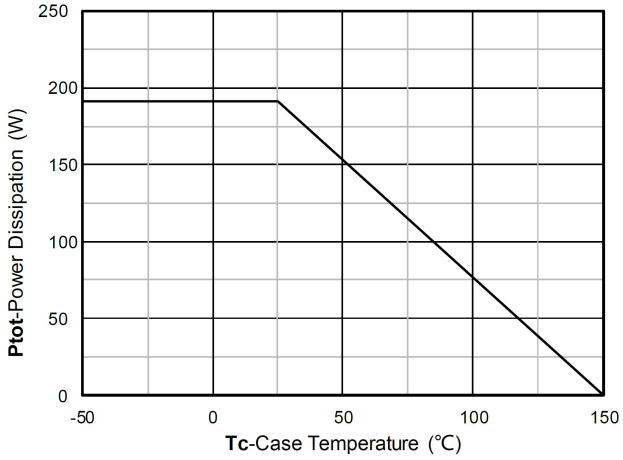
Capacitance Characteristics



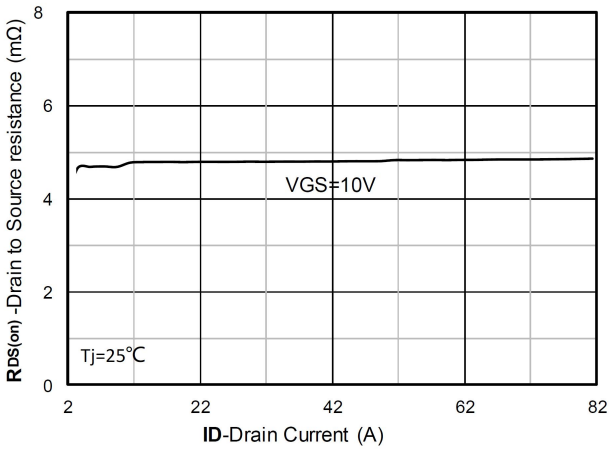
Gate Charge



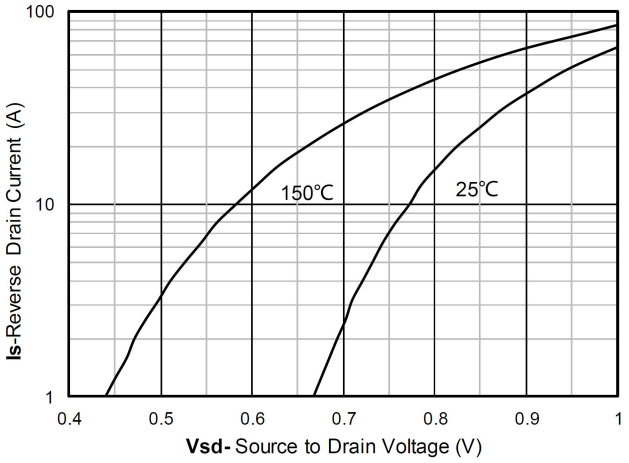
Current dissipation



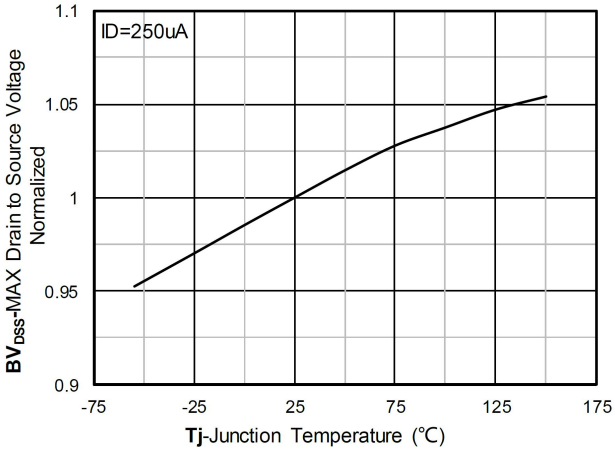
Power dissipation



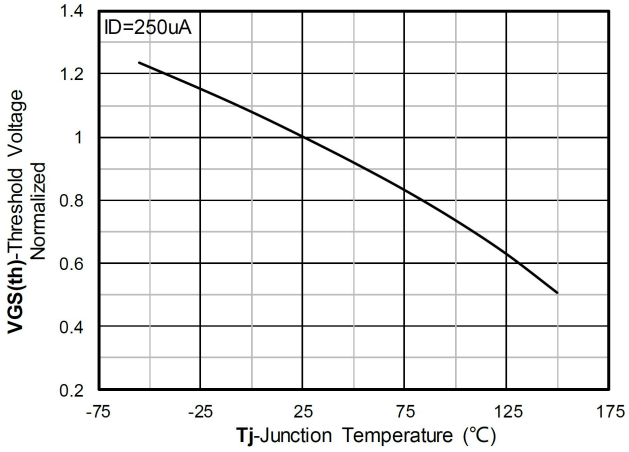
RDS(on) VS Drain Current



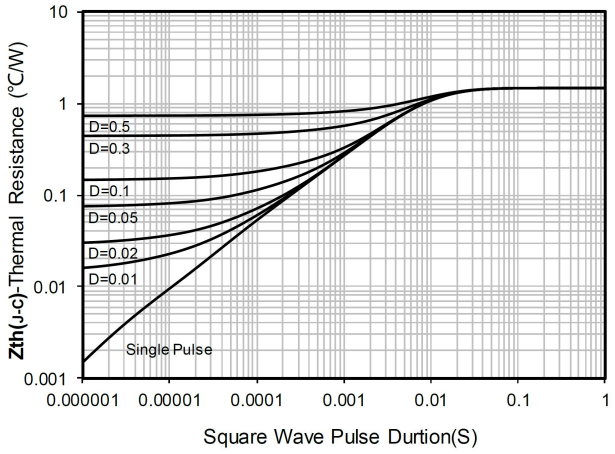
Forward characteristics of reverse diode



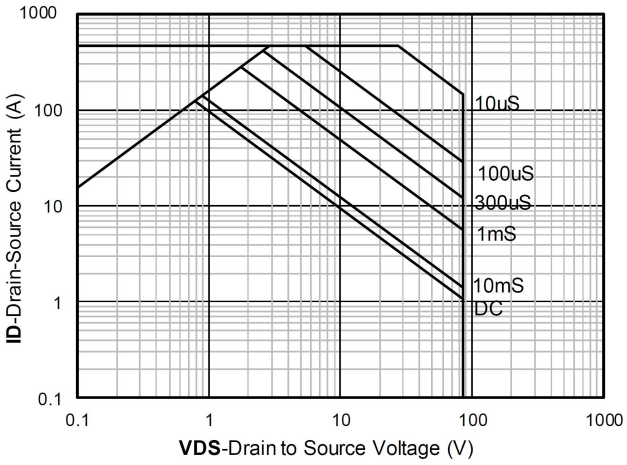
Normalized breakdown voltage



Normalized Threshold voltage

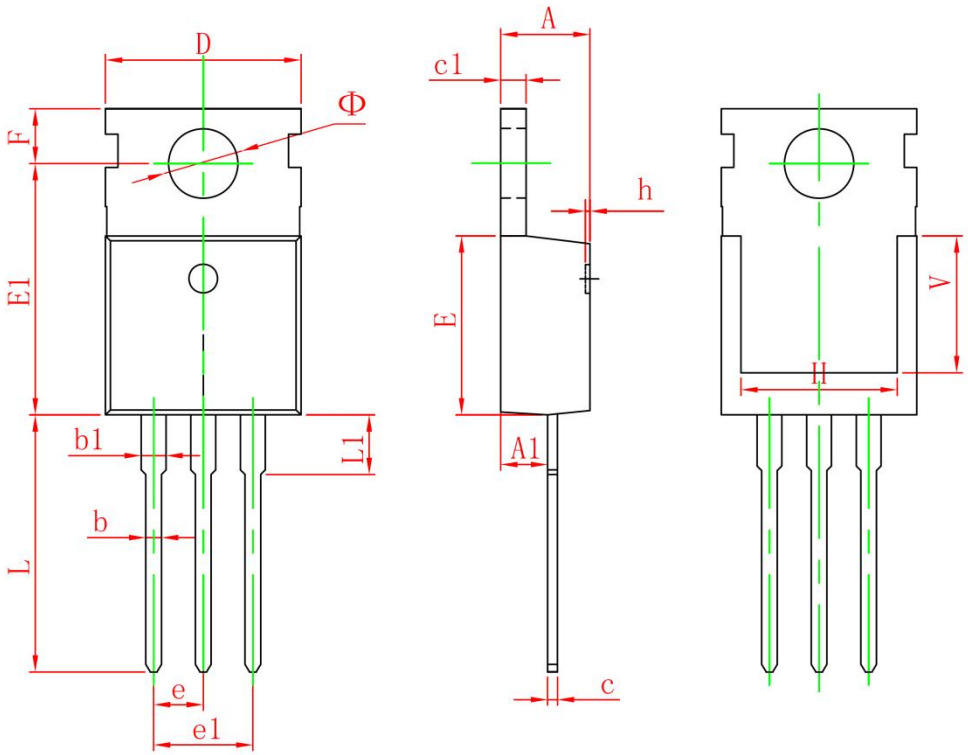


Maximum Transient Thermal Impedance



Safe Operation Area

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150