

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
80V	2.9mΩ@10V	200A



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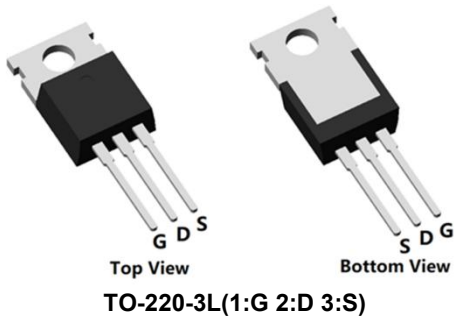
## Feature

- Fast Switching
- Low Gate Charge and R<sub>DS(on)</sub>
- 100% Single Pulse avalanche energy Test

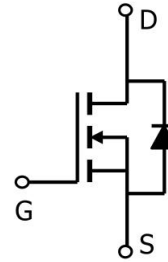
## Applications

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

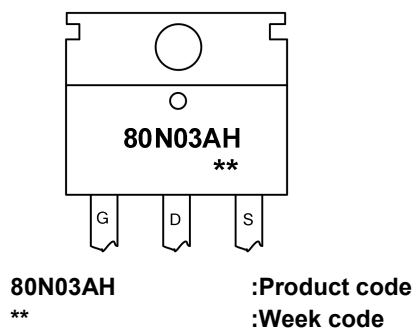
## Package



## Circuit diagram



## Marking



## Order Information

Device	Package	Unit/Tube
SP80N03AHTQ	TO-220-3L	50

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	80	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (Tc=25°C)	I <sub>D</sub>	200	A
Continuous Drain Current (Tc=100°C)	I <sub>D</sub>	133	A
Pulsed Drain Current	I <sub>DM</sub>	800	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	1161	mJ
Power Dissipation (Tc=25°C)	P <sub>D</sub>	300	W
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	0.42	°C/W
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 150	°C

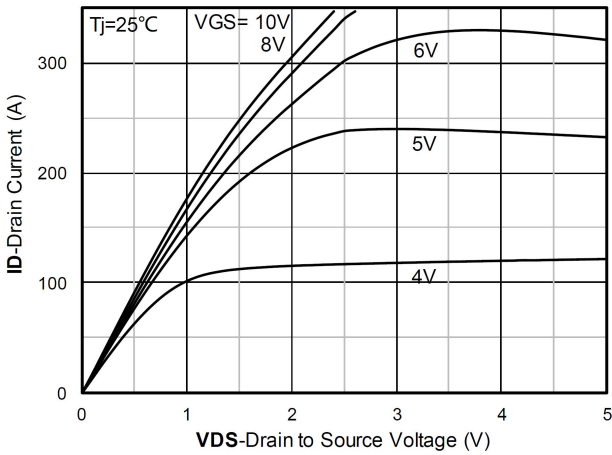
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V, ID=250uA	80	-	-	V
Drain Cut-Off Current	I <sub>DSS</sub>	VDS=64V, VGS=0V, TJ=25°C	-	-	1	μA
Gate Leakage Current	I <sub>GSS</sub>	VGS=±20V, VDS=0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	VGS=VDS, ID=250uA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	VGS=10V, ID=75A	-	2.9	4.5	mΩ
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	VDS=50V, VGS=0V, f=1MHz	-	7610	-	pF
Output Capacitance	C <sub>oss</sub>		-	722	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	386	-	
Total Gate Charge	Q <sub>g</sub>	VDS=60V, VGS=10V, ID=75A	-	183	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	44	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	65	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	VDD=48V, VGS=10V, RG=6Ω, ID=75A	-	29	-	nS
Rise Time	t <sub>r</sub>		-	120	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	68	-	
Fall Time	t <sub>f</sub>		-	74	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	200	A
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =20A, di/dt=100A/us, TJ=25°C	-	55	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	112	-	nC

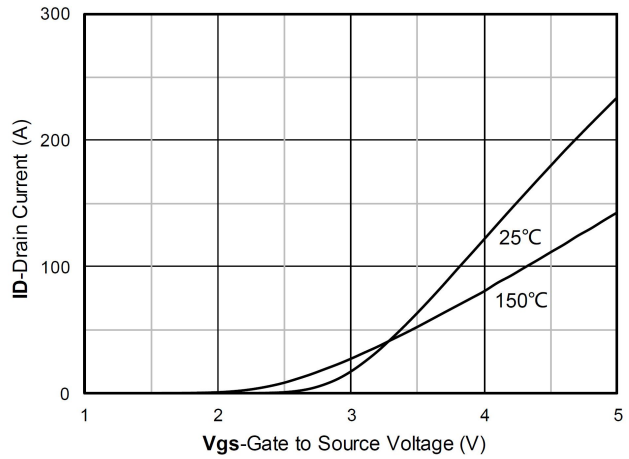
**Note :**

1. The test condition is VDD=45V, VGS=10V, L=0.3mH, RG=25Ω

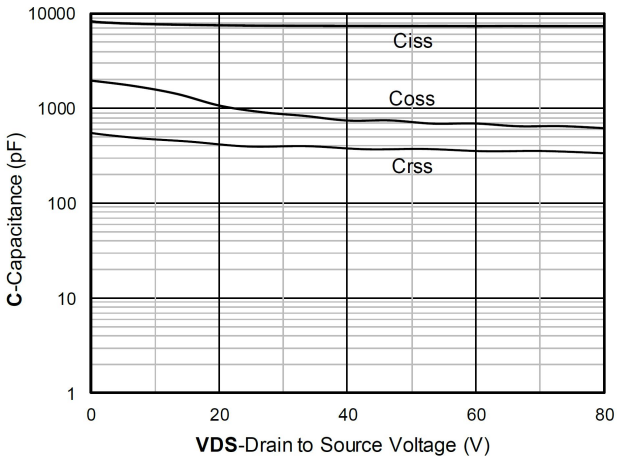
**Typical Characteristics**



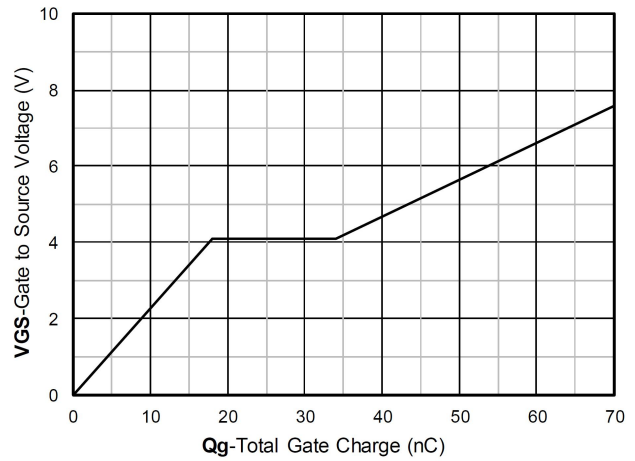
Output Characteristics



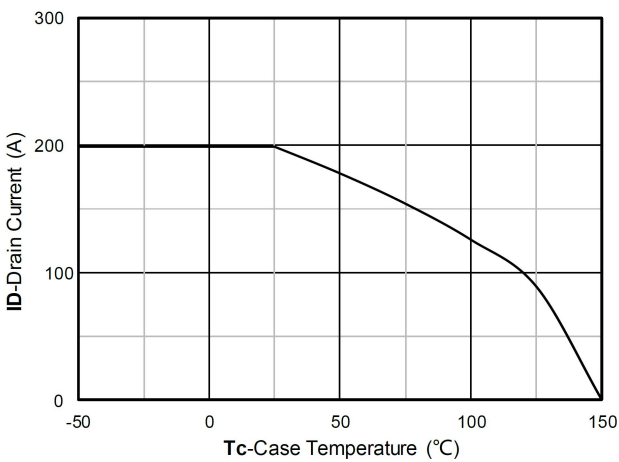
Transfer Characteristics



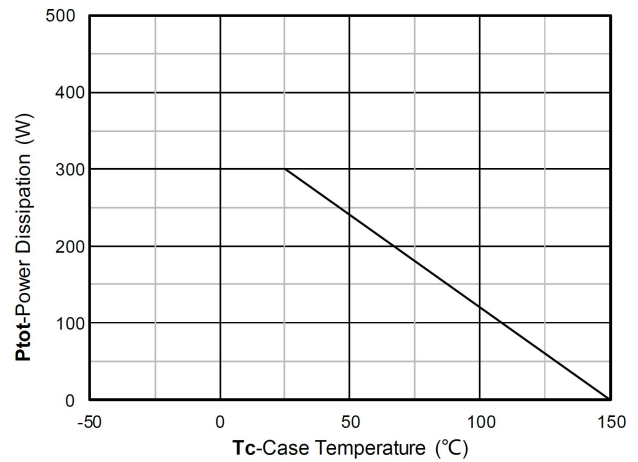
Capacitance Characteristics



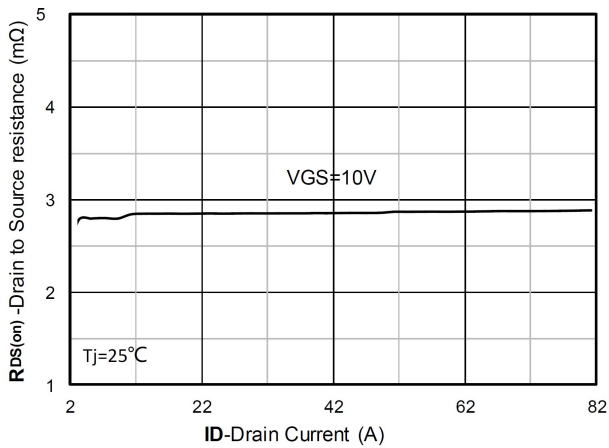
Gate Charge



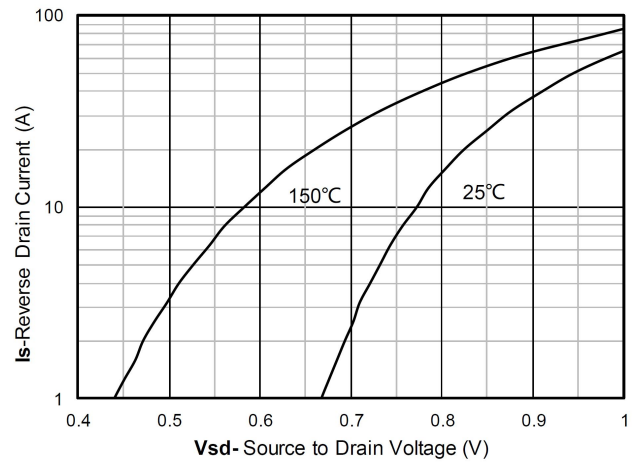
Current dissipation



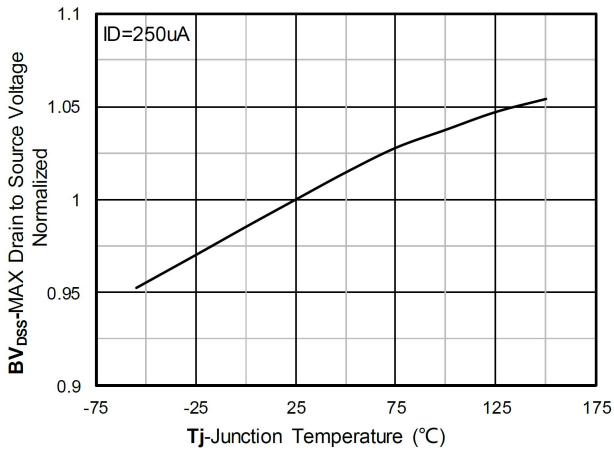
Power dissipation



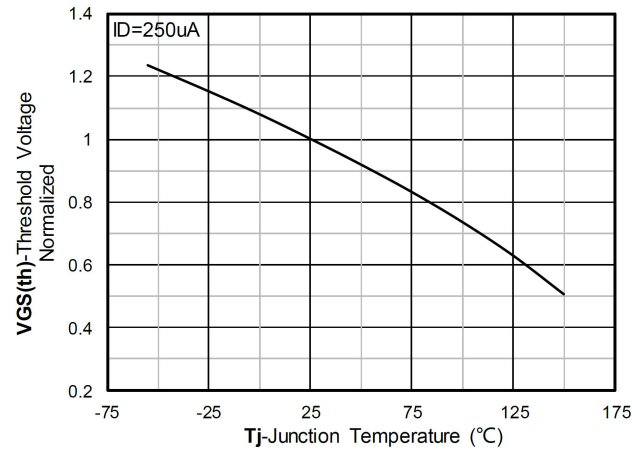
RDS(on) VS Drain Current



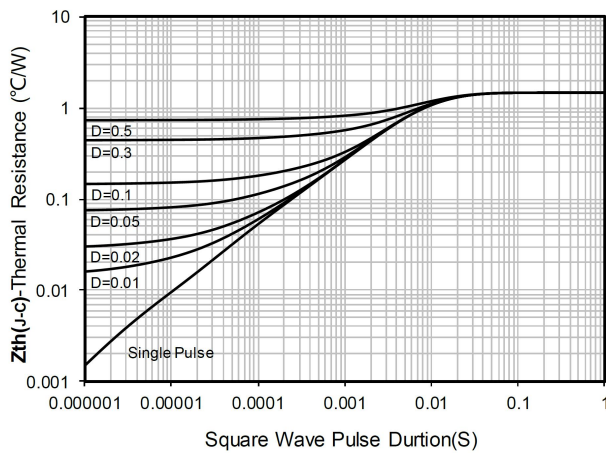
Forward characteristics of reverse diode



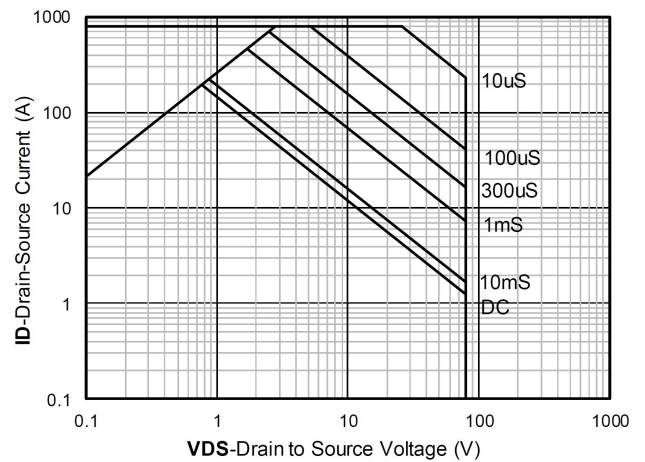
Normalized breakdown voltage



Normalized Threshold voltage

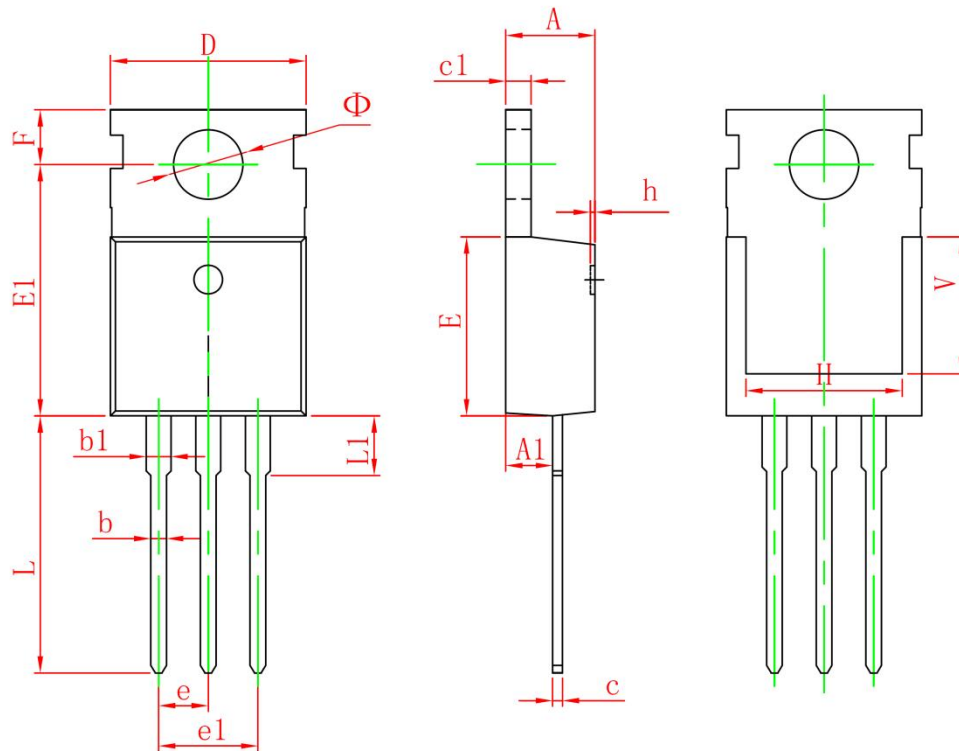


Maximum Transient Thermal Impedance



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

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