

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.6mΩ@10V	180A
	2.6mΩ@4.5V	



合肥矽普半导体

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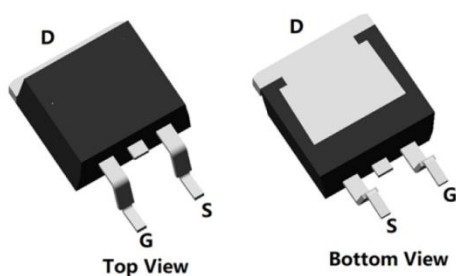
Feature

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

Applications

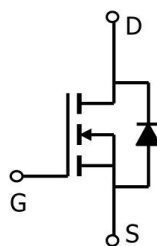
- DC-DC Converters
- Motor Control
- Portable equipment application

Package

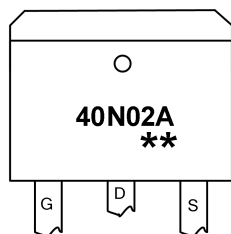


TO-263(1:G 2:D 3:S)

Circuit diagram



Marking



40N02A
**

: Device Code
: Week Code

Order Information

Device	Package	Unit/Tape
SP40N02ATD	TO-263	800

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	180	A
Continuous Drain Current (Tc=100°C)	I_D	120	A
Pulse Drain Current Tested	I_{DM}	720	A
Single pulsed avalanche energy ¹	E_{AS}	841	mJ
Power Dissipation (Tc=25°C)	P_D	246	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.51	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

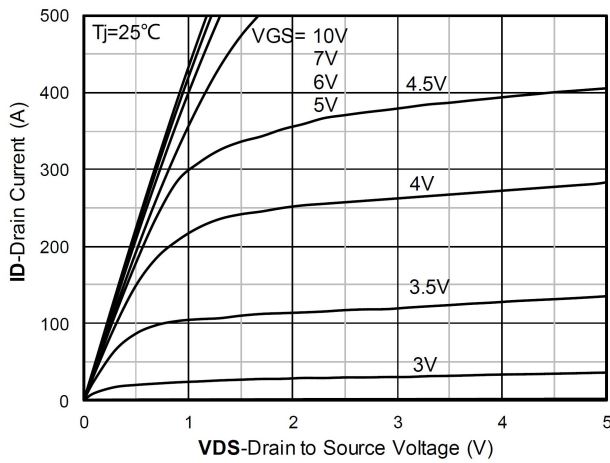
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	40	-	-	V
Drain-Source Leakage Current	IDSS	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS =10V, ID =20A	-	1.6	2	mΩ
		VGS =4.5V, ID =10A	-	2.6	3.5	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=20V , VGS=0V , f=1MHz	-	10800	-	pF
Output Capacitance	Coss		-	1940	-	
Reverse Transfer Capacitance	Crss		-	760	-	
Total Gate Charge	Qg	VDS=20V , VGS=10V , ID=30A	-	147	-	nC
Gate-Source Charge	Qgs		-	50	-	
Gate-Drain Charge	Qgd		-	31	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=20V, VGS=10V , RG=2.7Ω, ID=30A	-	26	-	nS
Rise Time	Tr		-	30	-	
Turn-Off Delay Time	Td(off)		-	59	-	
Fall Time	Tf		-	19	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	180	A
Reverse recover time	Trr	IS=30A, di/dt=100A/us, Tj=25℃	-	23	-	nS
Reverse recovery charge	Qrr		-	29	-	nC

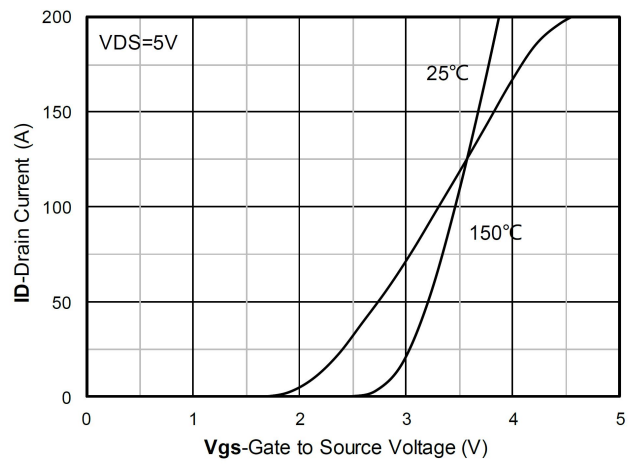
Note:

- The EAS Test condition is $V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$

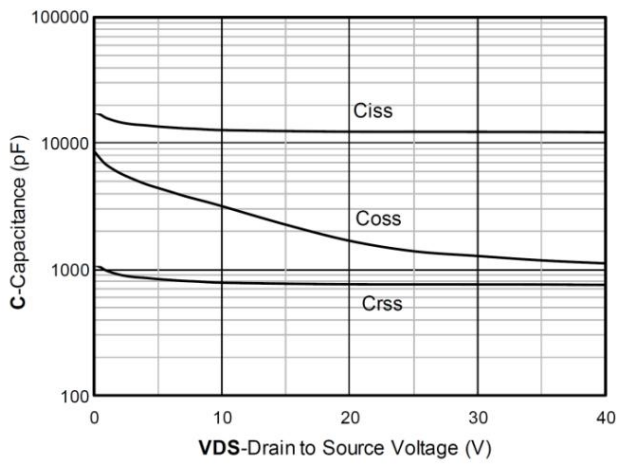
Typical Characteristics



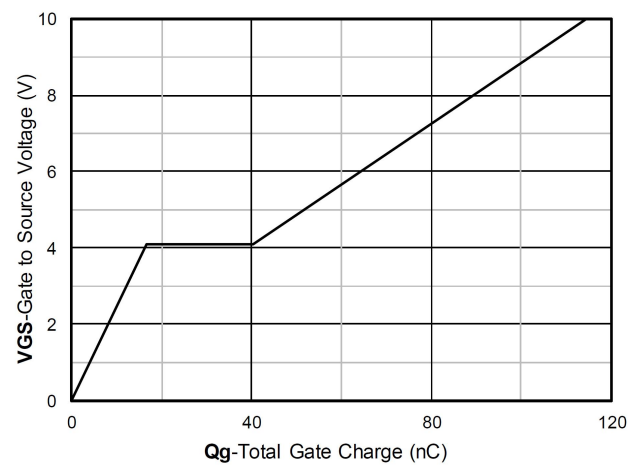
Output Characteristics



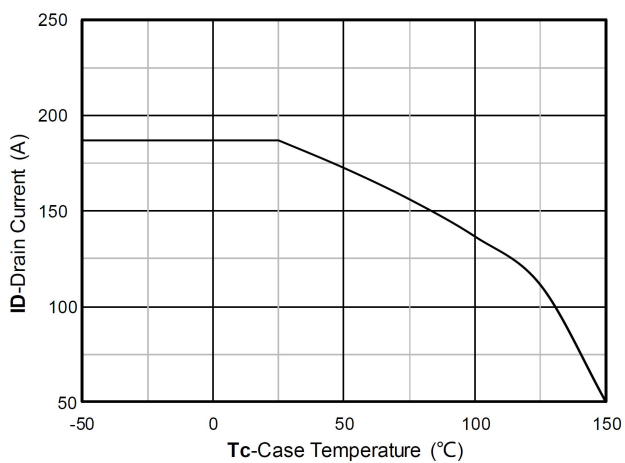
Transfer Characteristics



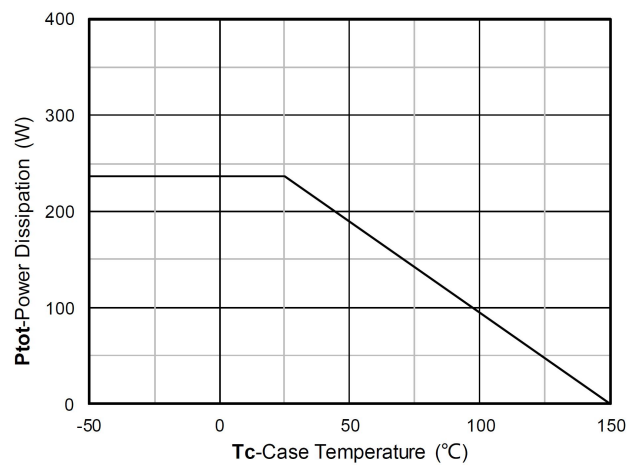
Capacitance Characteristics



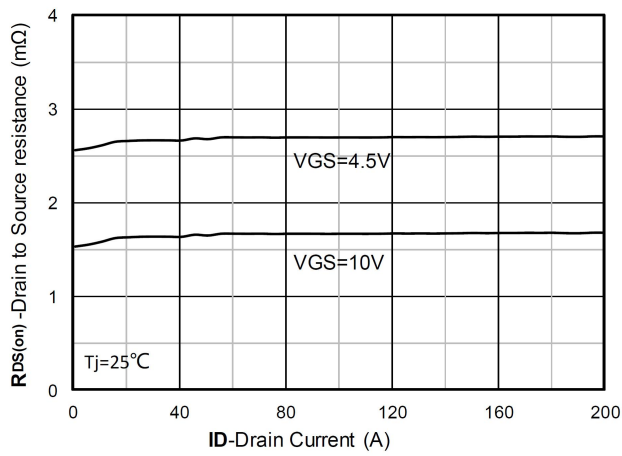
Gate Charge



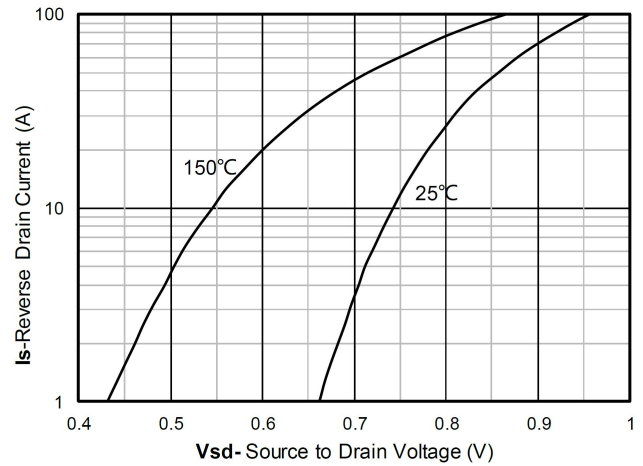
Current dissipation



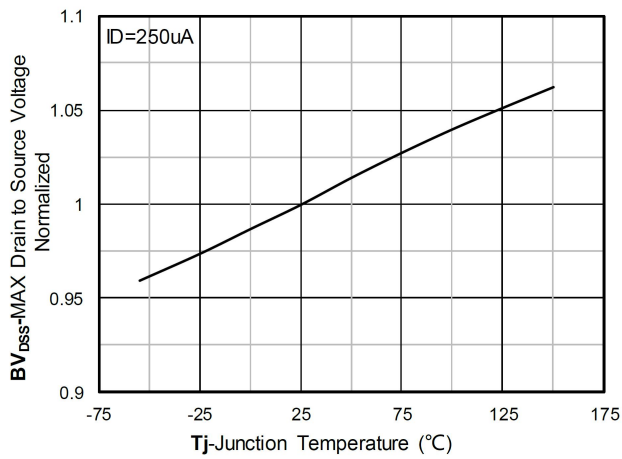
Power dissipation



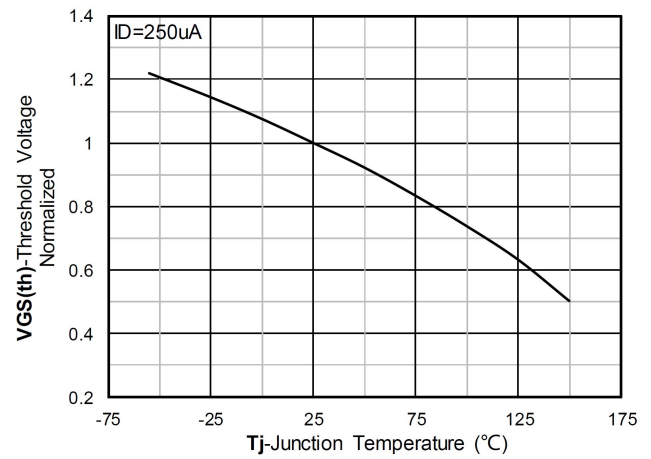
RDS(on) VS Drain Current



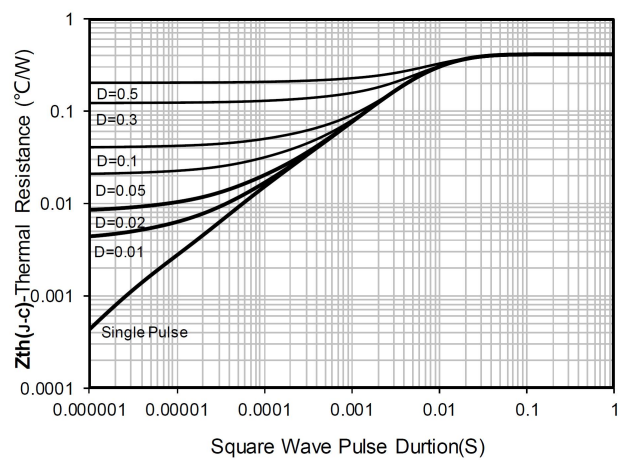
Forward characteristics of reverse diode



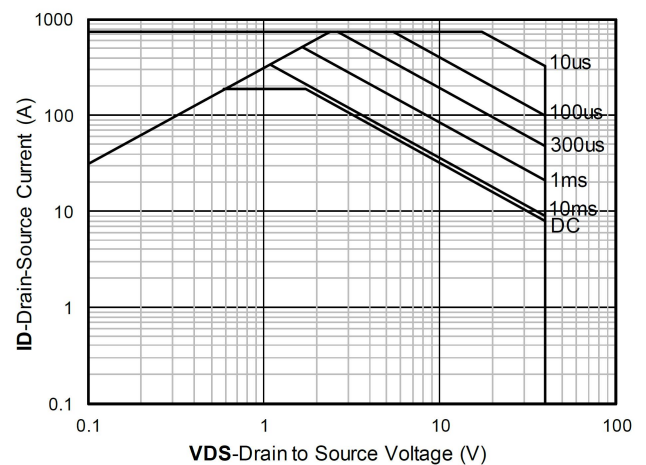
Normalized breakdown voltage



Normalized Threshold voltage

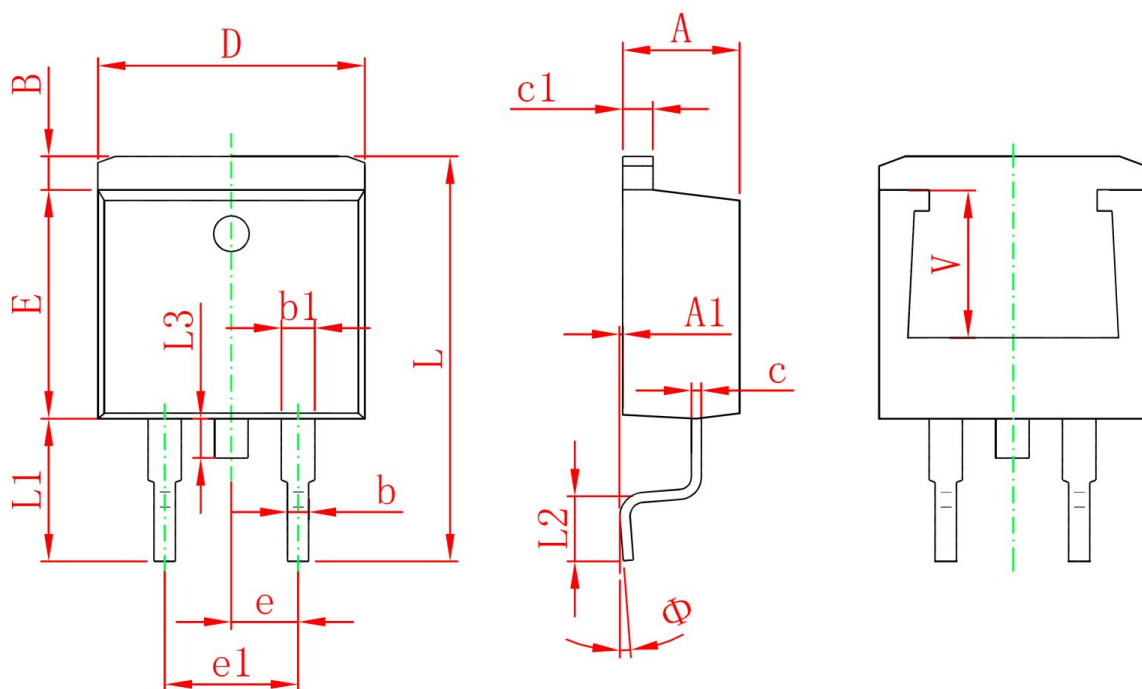


Maximum Transient Thermal Impedance



Safe Operation Area

TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	