

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
85V	$3.5m\Omega@10V$	130A



**合肥矽普半导体**

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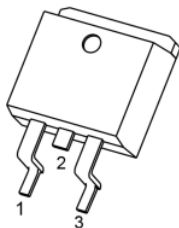
## Feature

- Fast Switching
- Low Gate Charge and  $R_{DS(on)}$
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Applications

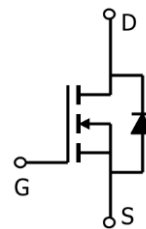
- Power switching application
- PWM Application
- DC-DC Converter

## Package

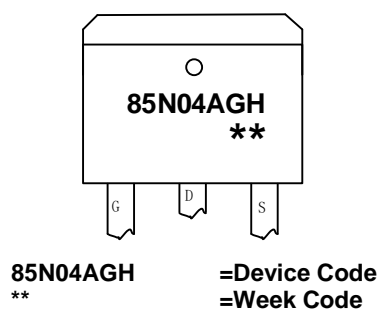


TO-263(1:G 2:D 3:S)

## Circuit diagram



## Marking



## Order Information

Device	Package	Unite/Tape
SP85N04AGHTD	TO-263-3L	800

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	85	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	130	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	520	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	756	mJ
Total Power Dissipation <sup>4</sup> (Tc=25°C)	$P_D$	140	W
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	0.89	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

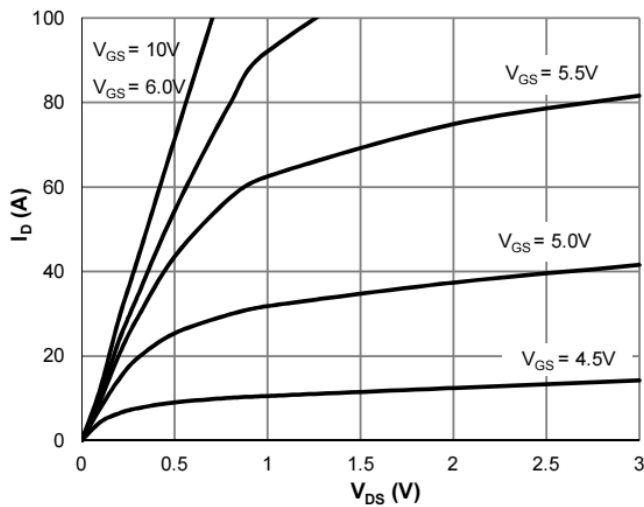
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V , ID=250uA	85	---	---	V
Drain-Source Leakage Current	IDSS	VDS=85V , 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	2.0	2.9	4.0	V
Static Drain-Source On-Resistance <sup>2</sup>	RDS(ON)	VGS=10V , ID=20A	---	3.5	4.5	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS=40V , VGS=0V , f=1MHz	---	3451	---	pF
Output Capacitance	Coss		---	677	---	
Reverse Transfer Capacitance	Crss		---	18	---	
Switching Characteristics						
Total Gate Charge	Qg	VDS=40V , VGS=10V , ID=20A	---	26	---	nC
Gate-Source Charge	Qgs		---	10	---	
Gate-Drain Charge	Qgd		---	11	---	
Turn-On Delay Time	Td(on)	VDD=40V , VGS=10V , RG=6Ω , ID=20A	---	16	---	ns
Rise Time	Tr		---	35	---	
Turn-Off Delay Time	Td(off)		---	33	---	
Fall Time	Tf		---	22	---	
Source-Drain Diode Characteristics						
Diode Forward Voltage <sup>2</sup>	VSD	VGS=0V , IS=1A , TJ=25℃	---	---	1.2	V

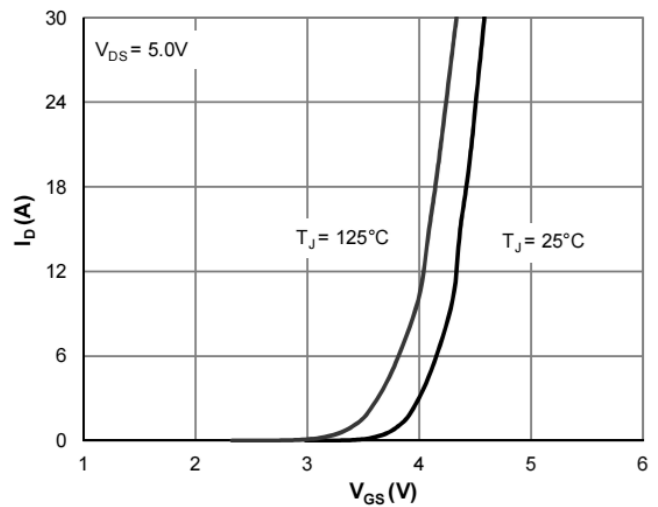
Note :

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- The EAS data shows Max. rating . The test condition is  $V_{DD}=42.5V, V_{GS}=10V, L=0.5mH, I_{AS}=55A$
- The power dissipation is limited by 150°C junction temperature

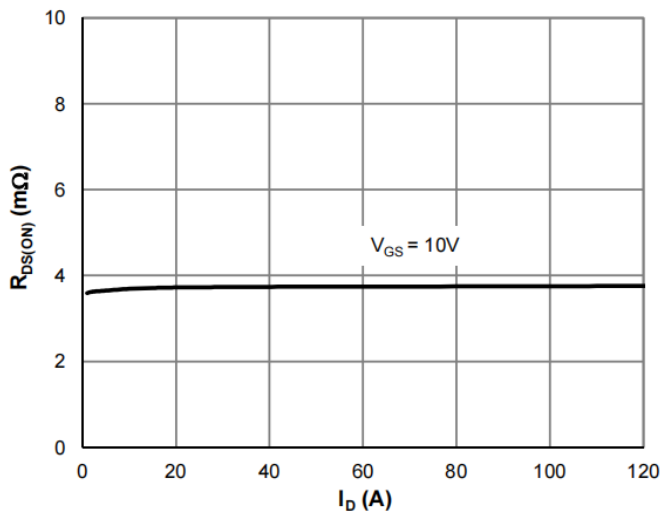
## Typical Characteristics



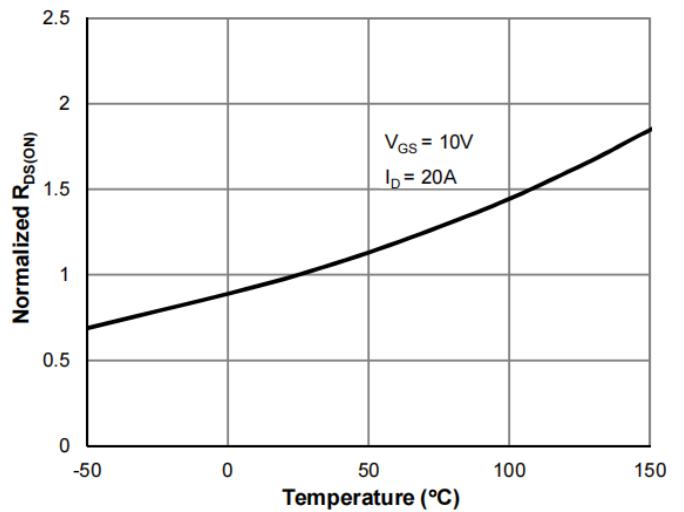
Typical Output Characteristics



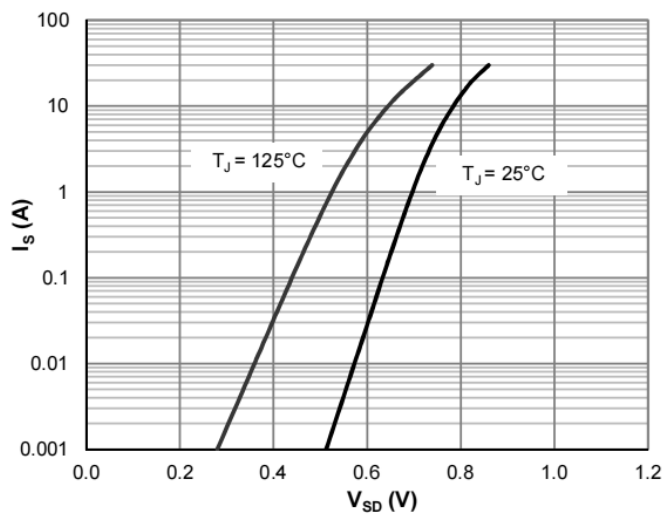
Transfer Characteristics



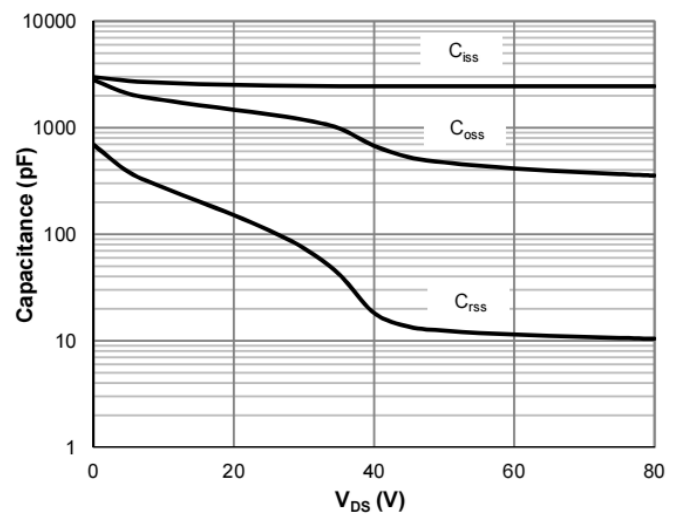
On-Resistance vs. Drain Current



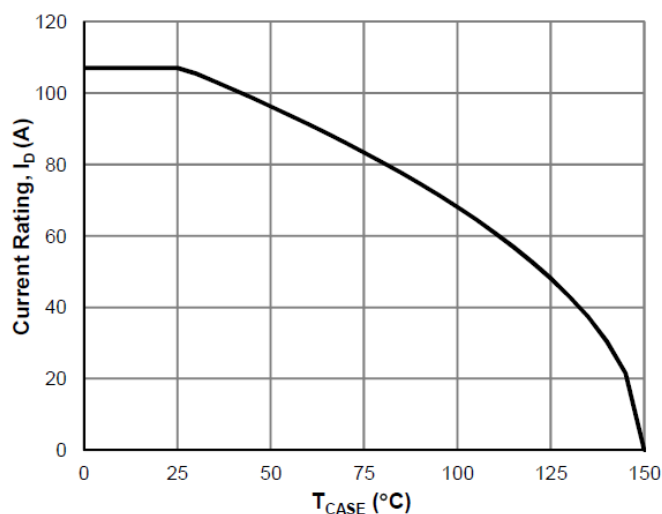
On-Resistance vs. Junction Temperature



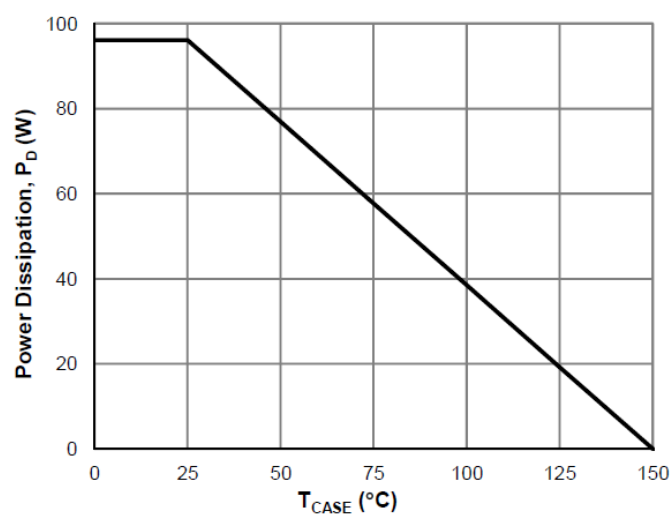
Body-Diode Characteristics



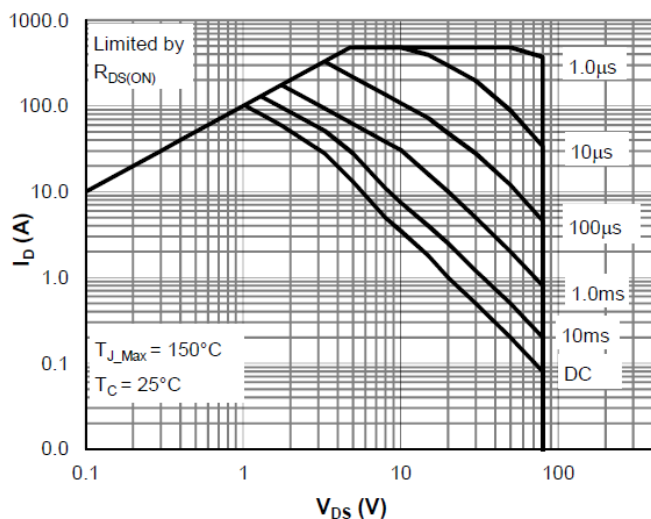
Capacitance Characteristics



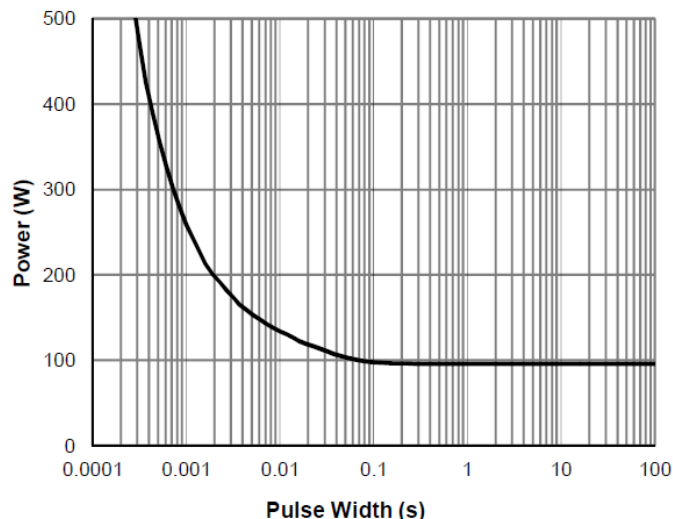
Current De-rating



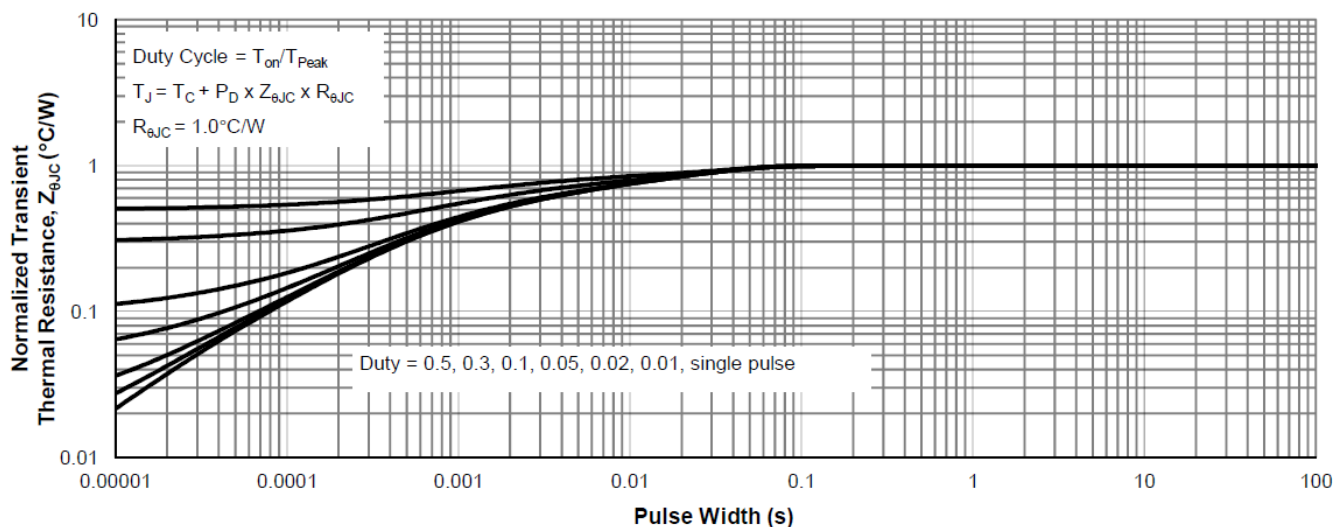
Power De-rating



Maximum Safe Operating Area

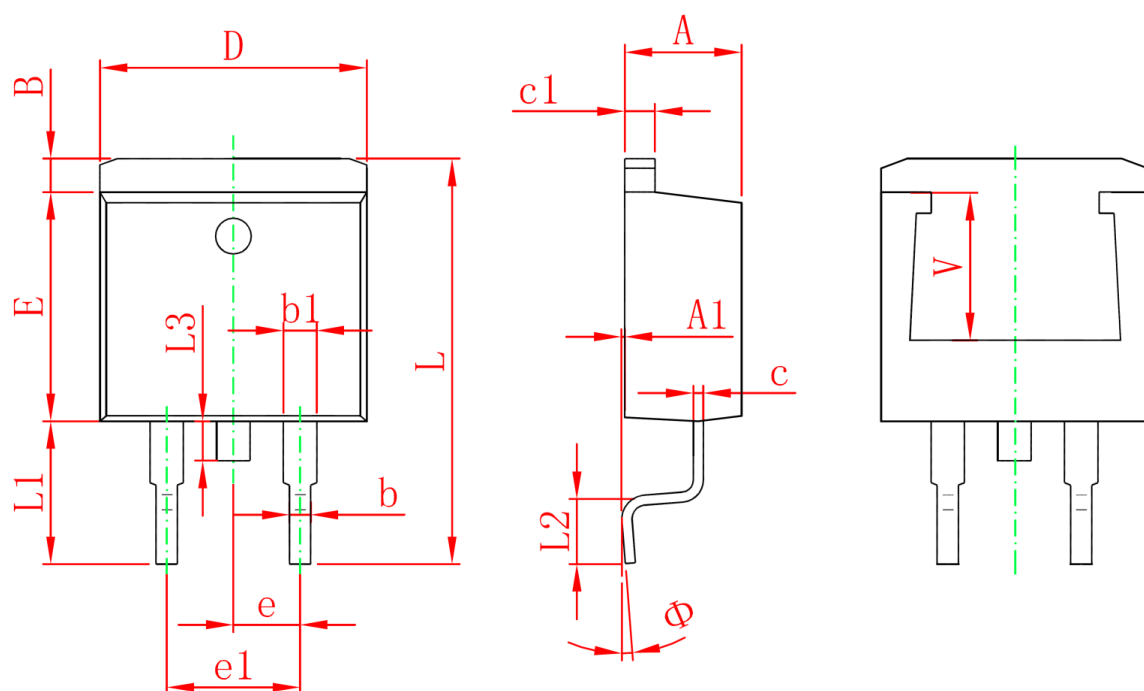


Single Pulse Power Rating, Junction-to-Case



Normalized Maximum Transient Thermal Impedance

# TO-263 Package Outline Dimensions



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.	