

Features

- High Speed Power Smooth Switching
- Enhanced Body Diode dv/dt Capability
- Enhanced Avalanche Ruggedness
- Low On Resistance
- Low Gate Charge

Application

- Brushed and BLDC Motor drive systems
- Power switching applications
- Inverter management system
- Automotive electronics

Product Summary

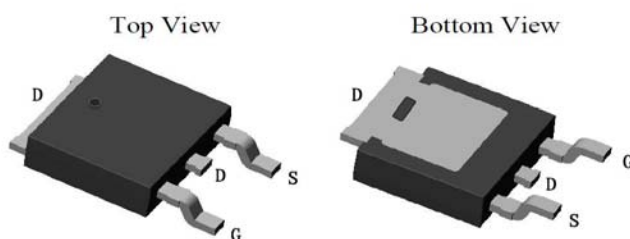
V_{DS}	80V
$R_{DS(on)}$	7.5mΩ
I_D	85A

100% DVDS Tested

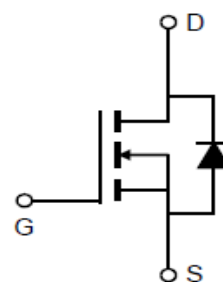
100% Avalanche Tested



TO-252



SFD085N80C2



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFD085N80C2	085N80C2	TO-252	Reel&Tape	330×16.7mm	16mm	2500pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	80	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C = 25^{\circ}C$	A
		$T_C = 100^{\circ}C$	
Pulsed Drain Current($T_C=25^{\circ}C, t_p$ limited by T_{Jmax})	$I_{D,Pulse}$	340	A
Single Pulsed Avalanche Energy($L=0.5mH, I_D=50A, V_{DD}=50V, T_C=25^{\circ}C$)	E_{AS}	625	mJ
Power Dissipation	P_{tot}	150	W
Junction Temperature	T_J	175	$^{\circ}C$
Storage Temperature	T_{STG}	-55 ~ 175	$^{\circ}C$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance , junction – case	R_{thJC}	1.0	°C/W
Thermal resistance , junction – ambient(min. footprint)	R_{thJA}	120	°C/W

Electrical Characteristics ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
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Static Characteristics

Drain - Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	80	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$ $T_C = 25^{\circ}\text{C}$ $T_C = 125^{\circ}\text{C}$	- - -	- - -	1 100	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$	-	7.5	8.5	mΩ

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 40V, V_{GS} = 0V, f = 1\text{MHz}$	-	5000	-	pF
Output Capacitance	C_{oss}		-	282	-	
Reverse Transfer Capacitance	C_{rss}		-	179	-	
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	1.3	-	Ω

Switching Characteristics

Total Gate Charge	Q_g	$V_{DS} = 40V, V_{GS} = 10V, I_D = 30A$	-	97	-	nC
Gate-source Charge	Q_{gs}		-	31	-	
Gate-drain Charge	Q_{gd}		-	28	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 40V, V_{GS} = 10V, I_D = 30A,$ $R_G = 6\Omega$	-	46	-	ns
Turn-on Rise Time	t_r		-	72	-	
Turn-off Delay Ttime	$t_{d(off)}$		-	38	-	
Turn-off Fall Time	t_f		-	24	-	

Body Diode Characteristic

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Diode continous forward current	I_S	-	-	-	85	A
Body Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 30A$	-	-	1.3	V
Body Diode Reverse Recovery Time	T_{rr}	$I_F = 60A, di/dt = 100A/\mu s$	-	38	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 60A, di/dt = 100A/\mu s$	-	55	-	nC

Typical Performance Characteristics

Figure 1 Output Characteristics

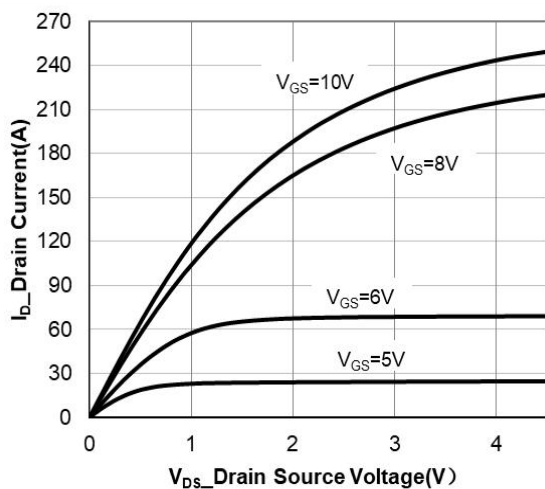


Figure 2 Transfer Characteristics

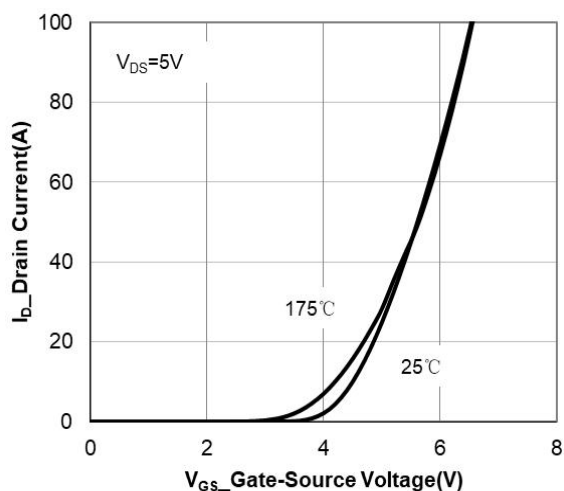


Figure 3 $R_{DS(on)}$ - Junction Temperature

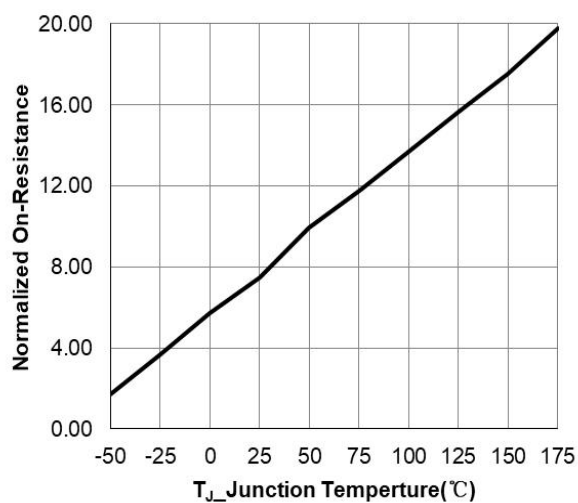


Figure 4 Gate Charge

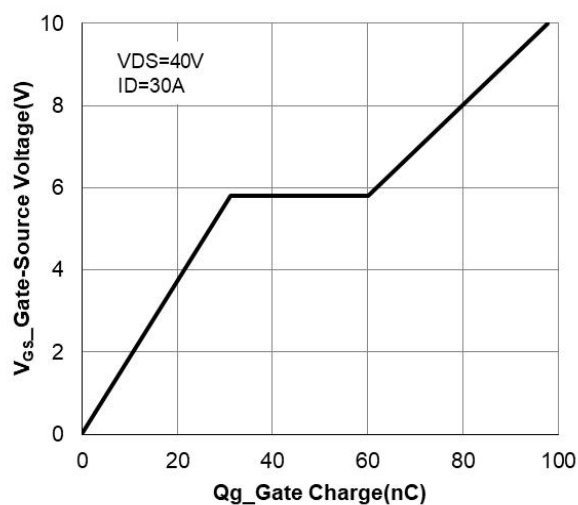


Figure 5 V_{SD} - Source-Drain Diode Forward

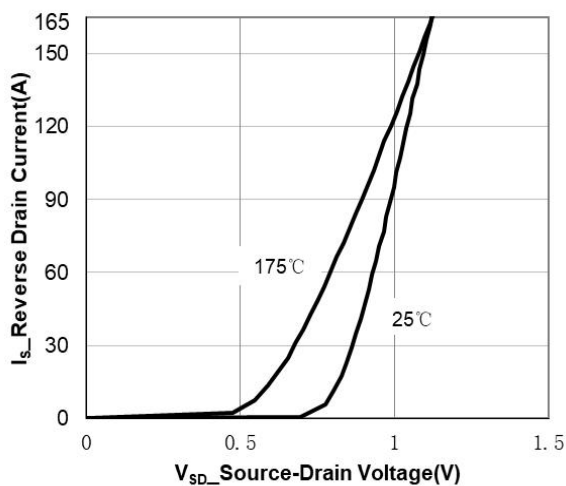


Figure 6 Capacitance Vs V_{DS}

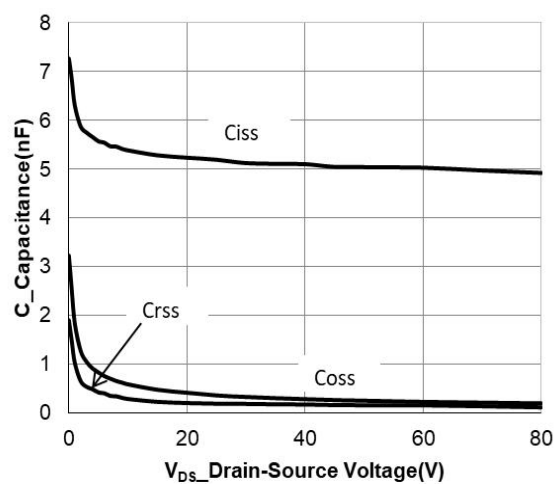
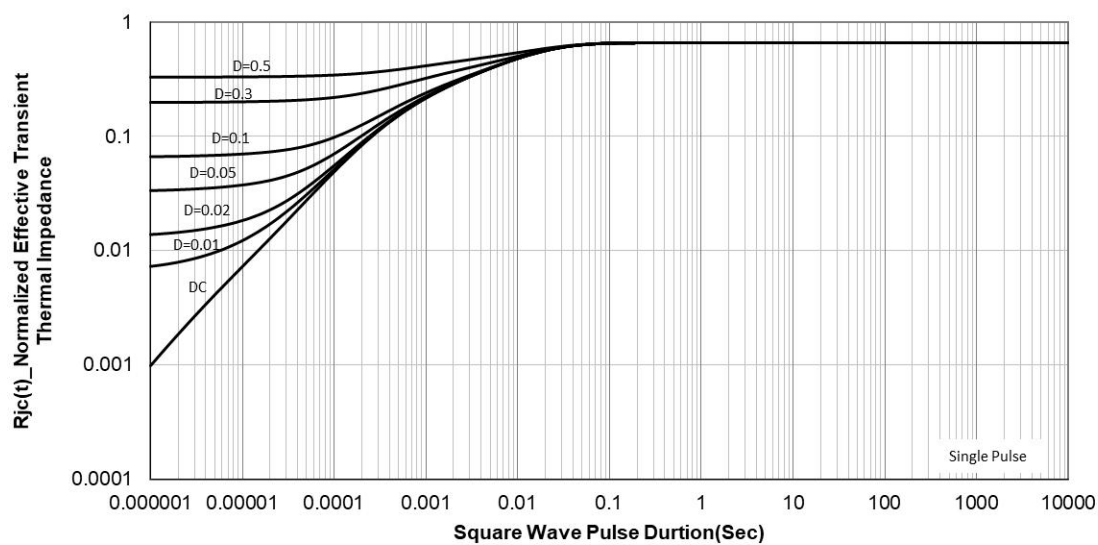
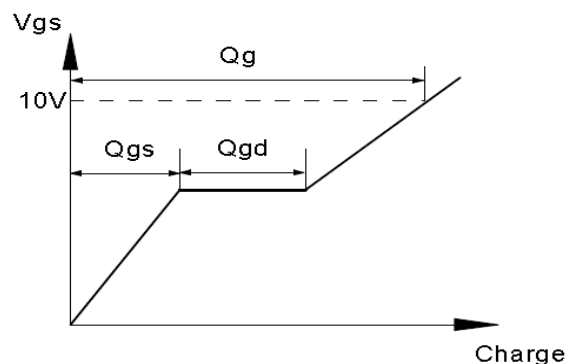
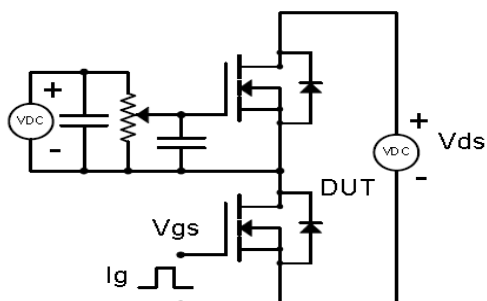


Figure 7 Normalized Maximum Transient Thermal Impedance

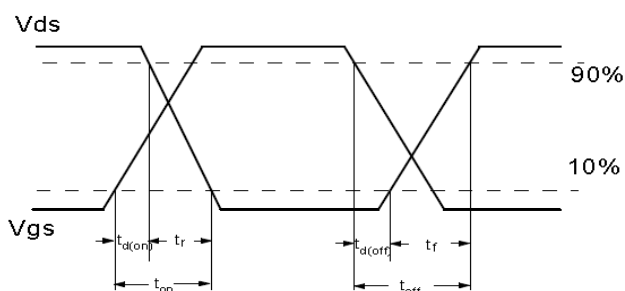
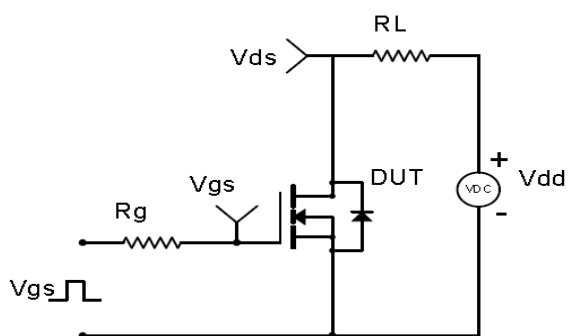


Test Circuit & Waveform

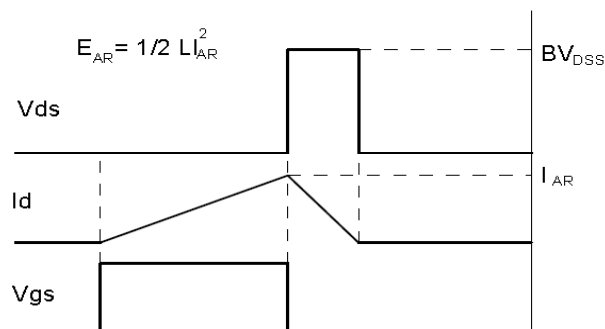
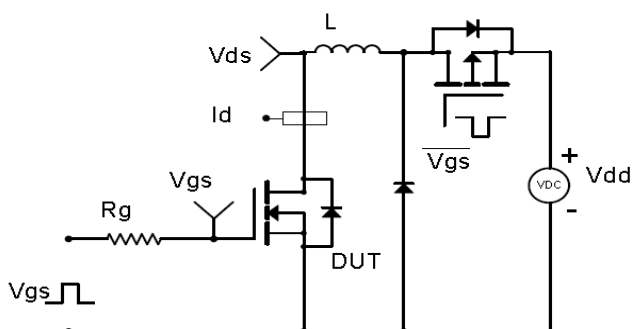
Gate Charge Test Circuit & Waveform



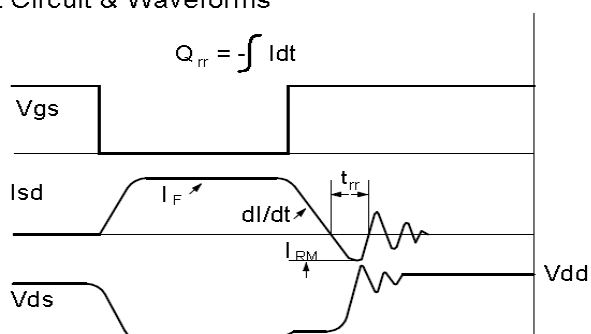
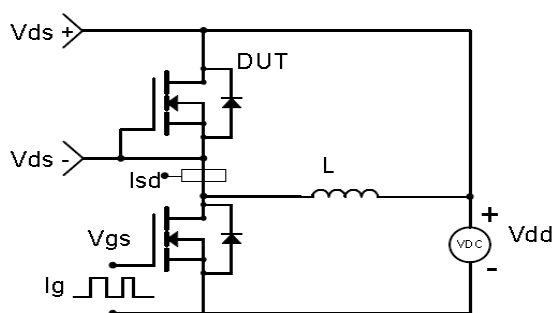
Resistive Switching Test Circuit & Waveforms

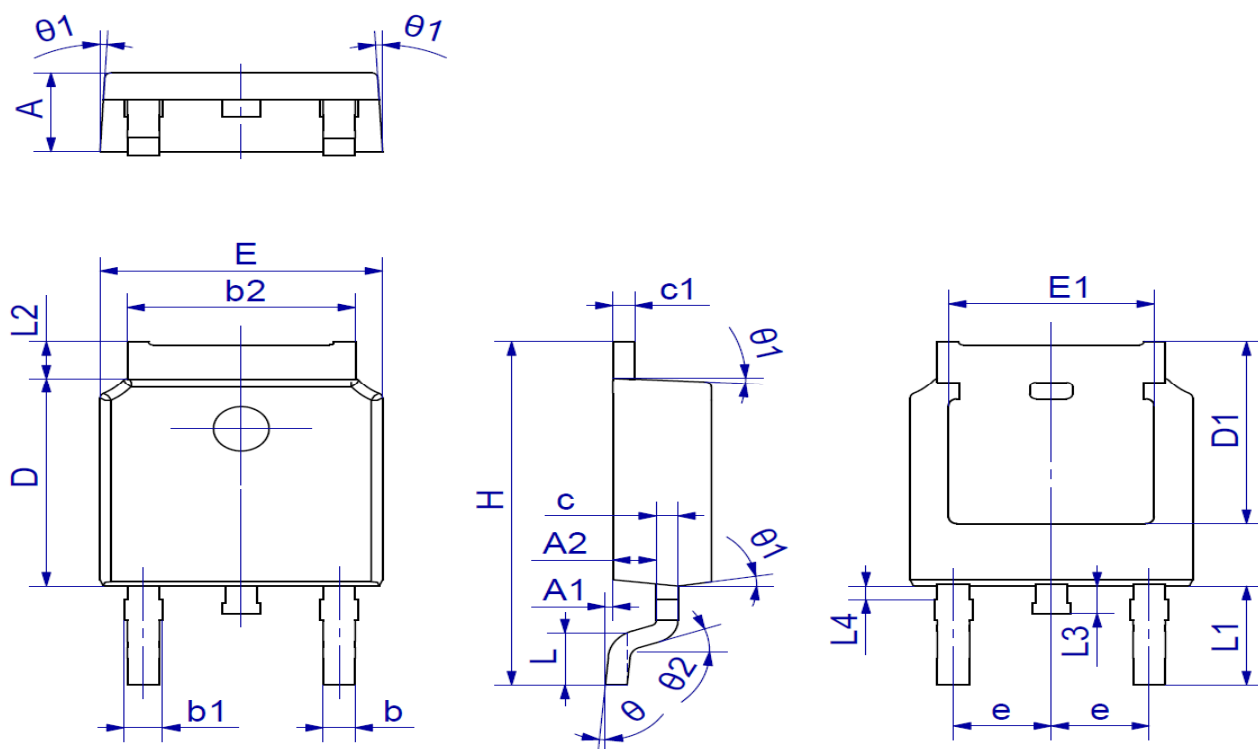


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-252-3L


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.50	0.083	0.098
A1	0	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.61	0.85	0.024	0.033
b1	0.71	0.91	0.028	0.036
b2	5.04	5.64	0.198	0.222
c	0.508 TYP.		0.02 TYP.	
c1	0.508 TYP.		0.02 TYP.	
D	5.8	6.3	0.228	0.248
D1	5	5.6	0.197	0.220
E	6.3	6.9	0.248	0.272
E1	4.55	5.15	0.179	0.203
e	2.286 TYP.		0.09 TYP.	
H	9.65	10.4	0.380	0.409
L	1.4	1.7	0.055	0.067
L1	2.90 REF.		0.114 REF.	
L2	0.75	1.35	0.030	0.053
L3	0.6	1.2	0.024	0.047
θ	0°	10°	0°	10°
θ1	5°	9°	5°	9°
θ2	25° REF.		25° REF.	

Revision History

Revision	Date	Major Changes
1.0	2022-12-26	Release of formal version

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Scilicon Electric reserves the right to improve product design,function and reliability without notice.