

RoHS Compliant Product

## Description

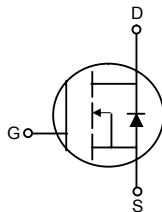
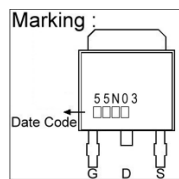
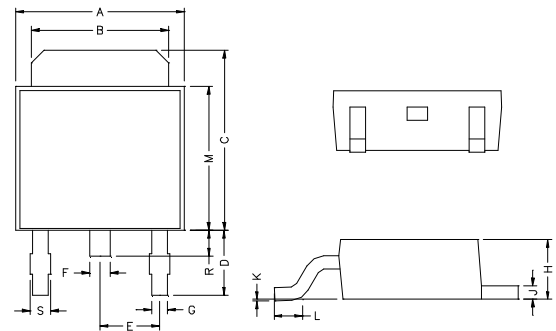
The SSD55N03 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

## Features

- \* Repetitive Avalanche Rated
- \* Dynamic dv/dt Rating
- \* Simple Drive Requirement
- \* Fast Switching

TO-252



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	2.20	2.80	K	0	0.15
E	2.30 REF.		L	0.90	1.50
F	0.70	0.90	M	5.40	5.80
S	0.60	0.90	R	0.80	1.20

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	25	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	V
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =25°C	55	A
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =100°C	35	A
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	215	A
Total Power Dissipation	P <sub>D</sub> @T <sub>C</sub> =25°C	62.5	W
Linear Derating Factor		0.5	W/°C
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	240	mJ
Avalanche Current	I <sub>AR</sub>	31	A
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55~+150	°C

## Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-case	R <sub>thj-c</sub>	2.0	°C/W
Thermal Resistance Junction-ambient	R <sub>thj-a</sub>	110	°C/W

### Electrical Characteristics (T<sub>j</sub>=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	25	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	0.037	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	-	3.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V
Drain-Source Leakage Current (T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =25V, V <sub>GS</sub> =0
Drain-Source Leakage Current (T <sub>j</sub> =150°C)		-	-	25	uA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	-	4.5	6	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =30A
		-	7	9		V <sub>GS</sub> =4.5V, I <sub>D</sub> =30A
Total Gate Charge <sup>3</sup>	Q <sub>g</sub>	-	16.8	-	nC	I <sub>D</sub> =28A V <sub>DS</sub> =20V V <sub>GS</sub> =5V
Gate-Source Charge	Q <sub>gs</sub>	-	6	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	4.9	-		
Turn-on Delay Time <sup>3</sup>	T <sub>d(ON)</sub>	-	15.1	-	nS	V <sub>DD</sub> =15V I <sub>D</sub> =28A V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω R <sub>D</sub> =0.53Ω
Rise Time	T <sub>r</sub>	-	4	-		
Turn-off Delay Time	T <sub>d(OFF)</sub>	-	45.2	-		
Fall Time	T <sub>f</sub>	-	7.6	-		
Input Capacitance	C <sub>iss</sub>	-	2326	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	331	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	174	-		
Forward Transconductance	G <sub>fs</sub>	-	30	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =28A

### Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage <sup>3</sup>	V <sub>SD</sub>	-	-	1.5	V	I <sub>S</sub> =20 A, V <sub>GS</sub> =0V, T <sub>j</sub> =25°C
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	55	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.5 V

Notes: 1. Pulse width limited by safe operating area.

2. Staring T<sub>j</sub>=25°C, V<sub>DD</sub>=25V, L=0.1mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=10A

3. Pulse width ≤300us, dutycycle ≤2%.

### Characteristics Curve

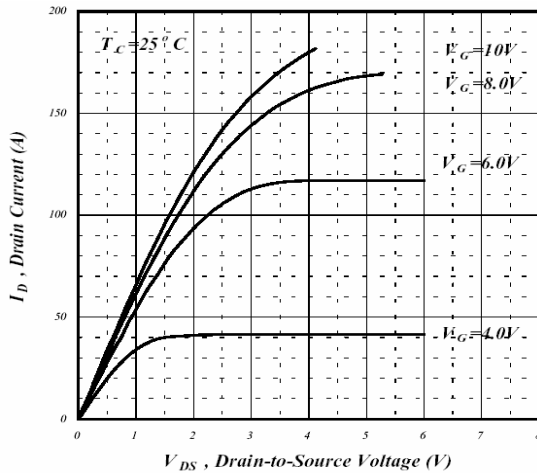


Fig 1. Typical Output Characteristics

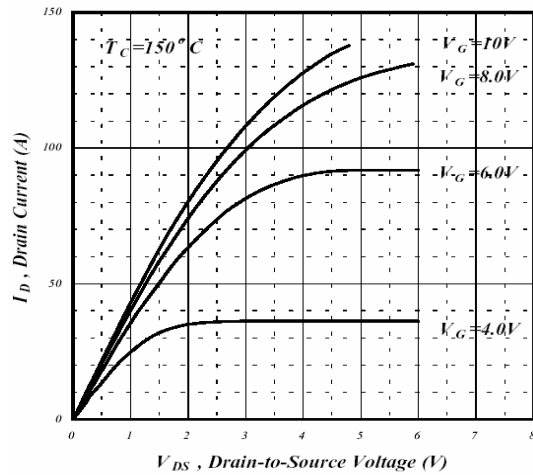


Fig 2. Typical Output Characteristics

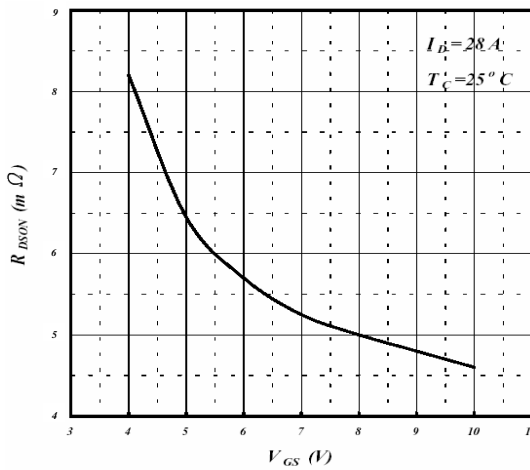


Fig 3. On-Resistance v.s. Gate Voltage

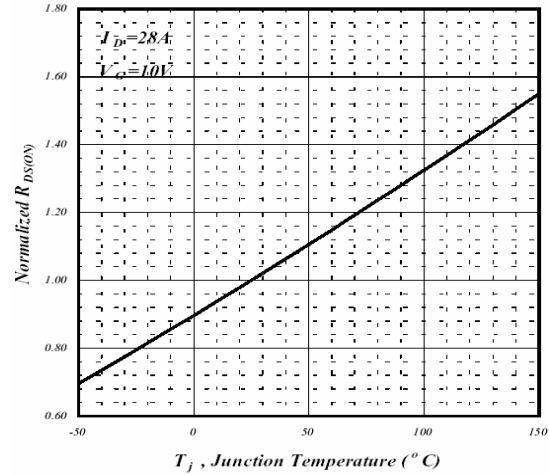


Fig 4. Normalized On-Resistance v.s. Junction Temperature

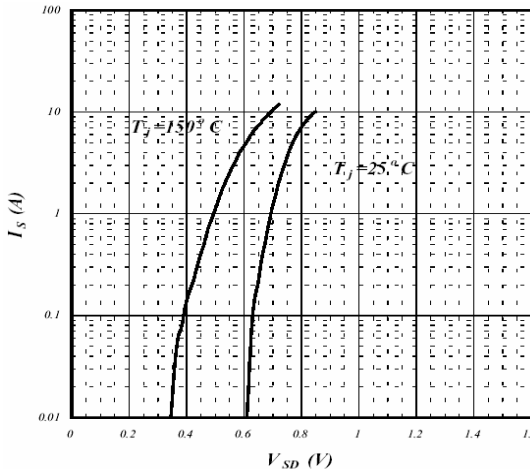


Fig 5. Forward Characteristics of Reverse Diode

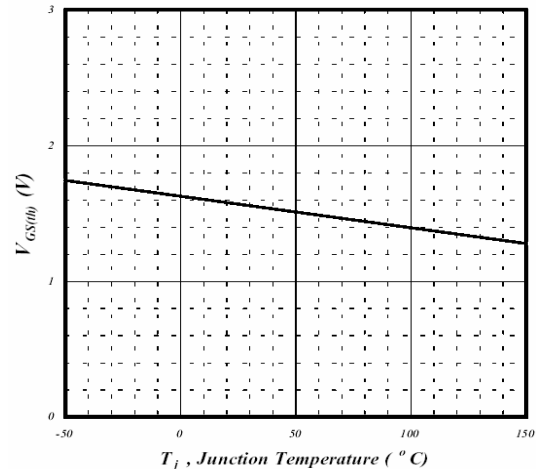
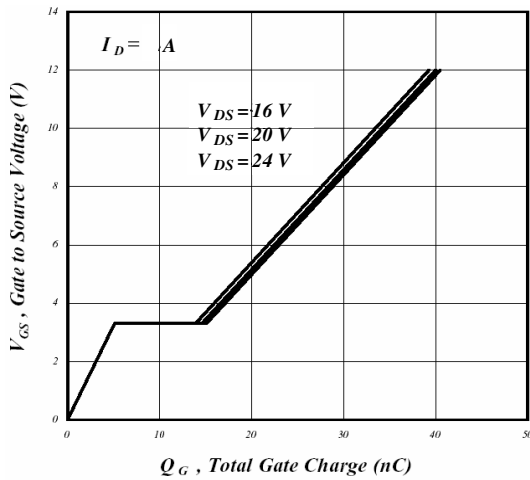
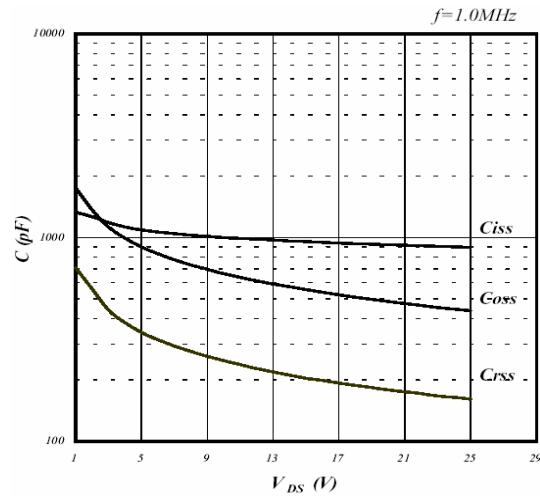


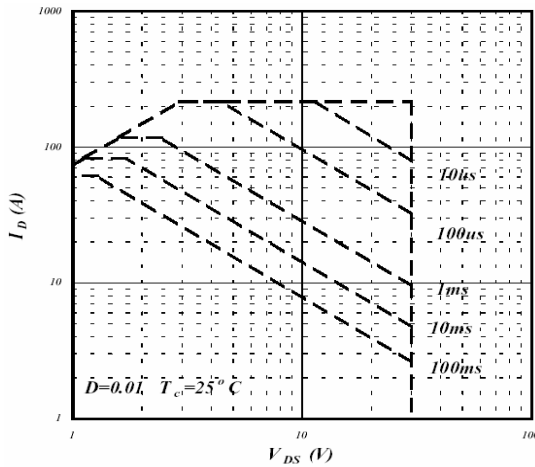
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



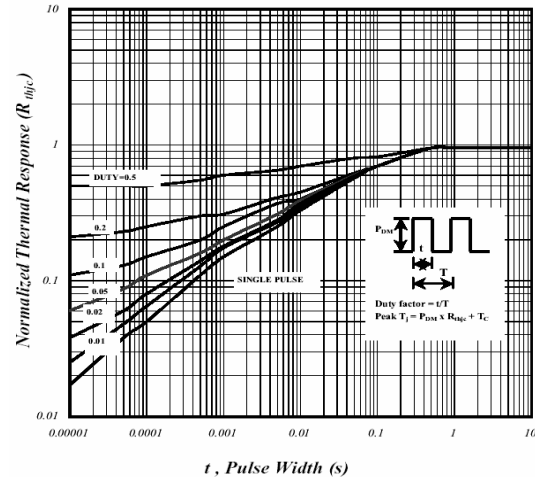
**Fig 7. Gate Charge Characteristics**



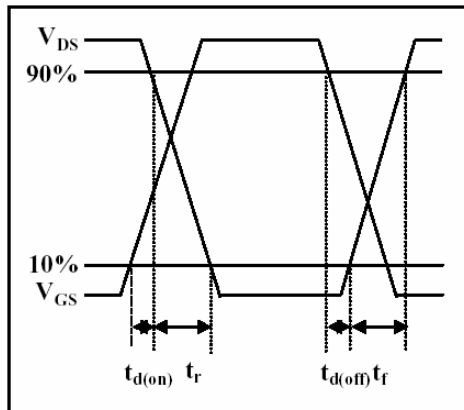
**Fig 8. Typical Capacitance Characteristics**



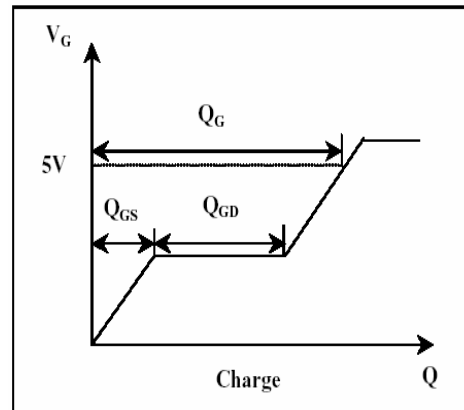
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**