Elektronische Bauelemente

SSD20N03

N-Ch Enhancement Mode Power MOSFET
20 A, 30 V, RDS(ON) 52 mΩ

RoHS Compliant Product
A suffix of "-C" specifies halogen free

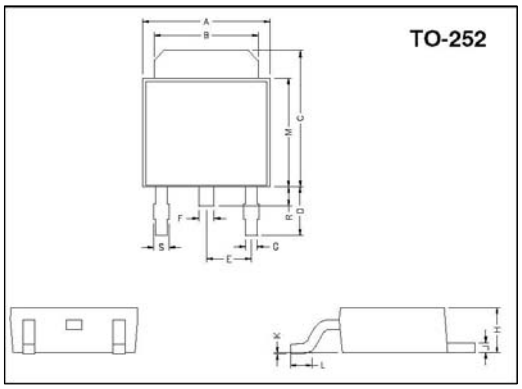
DESCRIPTION

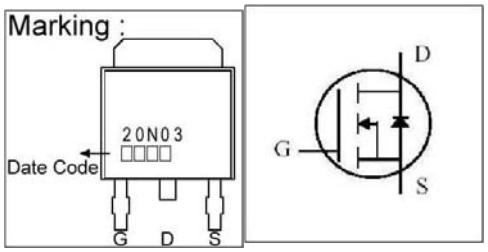
The SSD20N03 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.
The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

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

PACKAGE DIMENSIONS





REF.	Millimeter Min.	Millimeter Max.	REF.	Millimeter Min.	Millimeter 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	2.40	3.00	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 at Ta = 25°C

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D @T_C=25℃	20	A
Continuous Drain Current	I_D @T_C=100℃	13	A
Pulsed Drain Current[1]	I_{DM}	53	A
Total Power Dissipation	P_D @Ta=25℃	31	W
Linear Derating Factor		0.25	W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	℃

THERMAL DATA

Parameter		Symbol	Value	Unit
Thermal Resistance Junction-case	Max.	Rθj-case	4.0	℃ / W
Thermal Resistance Junction-ambient	Max.	Rθj-amb	110	℃ / W

ELECTRICAL CHARACTERISTICS (Tj = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D= 250uA
Breakdown Voltage Temperature	$\Delta BV_{DSS}/\Delta Tj$	-	0.037	-	V /°C	Reference to 25°C, I_D= 1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	3.0	V	V_{DS}=V_{GS}, I_D= 250uA
Forward Transconductance	g_{fs}	-	3	-	S	V_{DS}= 10V, I_D= 10A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}= 30V, V_{GS}=0
Drain-Source Leakage Current(Tj=150℃)		-	-	100	uA	V_{DS}= 24V, V_{GS}= 0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	52	mΩ	V_{GS}= 10V, I_D= 10A
		-	-	85		V_{GS}= 4.5V, I_D= 8A
Total Gate Charge[2]	Q_g	-	6.1	-	nC	I_D= 10 A V_{DS}= 24 V V_{GS}= 5 V
Gate-Source Charge	Q_{gs}	-	1.4	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	4	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	4.9	-	ns	V_{DS}=15 V I_D= 20 A V_{GS}= 10 V R_G= 3.3 Ω R_D= 0.75 Ω
Rise Time	T_r	-	29	-		
Turn-off Delay Time	$T_{d(off)}$	-	14.3	-		
Fall Time	T_f	-	3.6	-		
Input Capacitance	C_{iss}	-	290	-	pF	V_{GS}=0 V V_{DS}=25 V f=1.0 MHz
Output Capacitance	C_{oss}	-	160	-		
Reverse Transfer Capacitance	C_{rss}	-	45	-		

SOURCE-DRAIN DIODE

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	1.3	V	I_S=20 A, V_{GS}=0 V, T_J = 25°C
Continuous Source Current (Body Diode)	I_S	-	-	20	A	V_D = V_G = 0V, V_S = 1.3 V
Pulsed Source Current (Body Diode)[1]	I_{SM}	-	-	53	A	

Notes: 1. Pulse width limited by safe operating area.
2. Pulse width≦300us, duty cycle≦2%.

CHARACTERISTIC CURVES

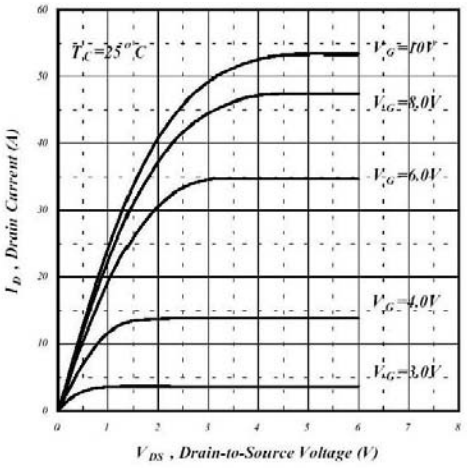


Fig 1. Typical Output Characteristics

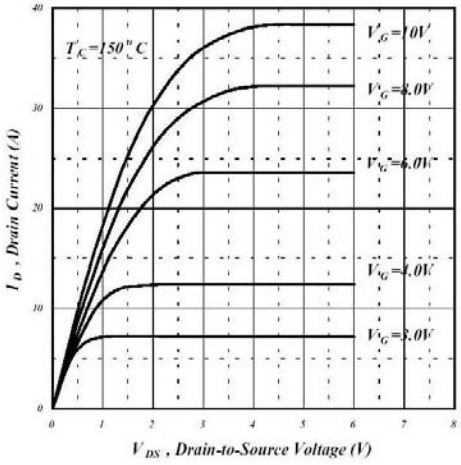


Fig 2. Typical Output Characteristics

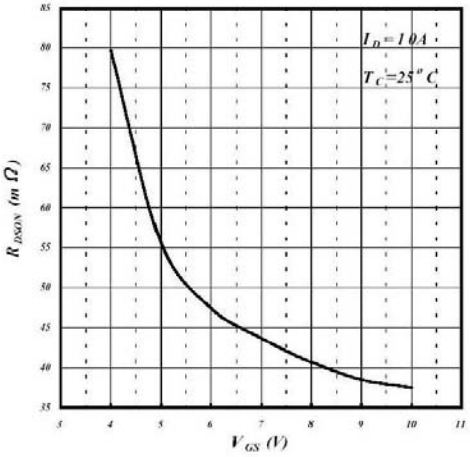


Fig 3. On-Resistance v.s. Gate Voltage

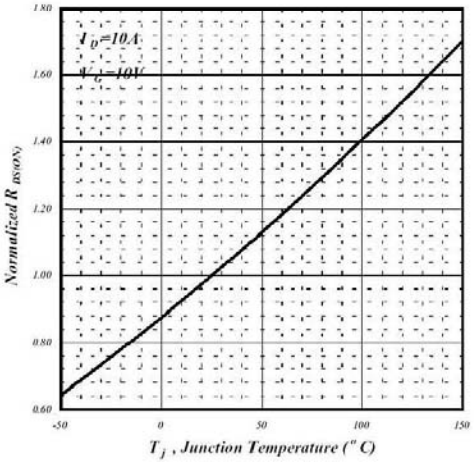


Fig 4. Normalized On-Resistance v.s. Junction Temperature

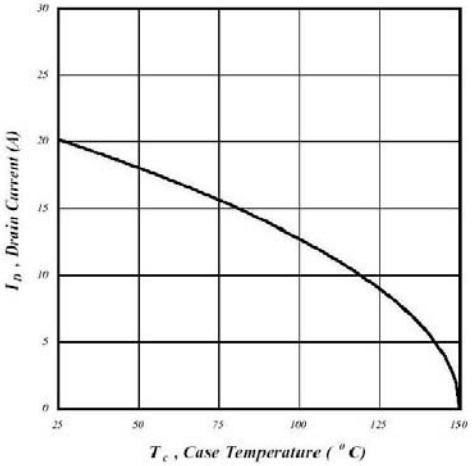


Fig 5. Maximum Drain Current v.s. Case Temperature

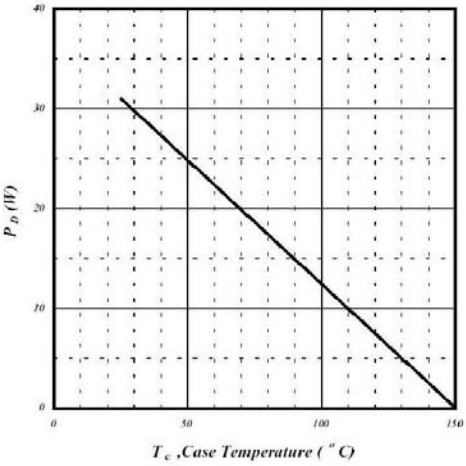


Fig 6. Type Power Dissipation

CHARACTERISTIC CURVES (cont'd)

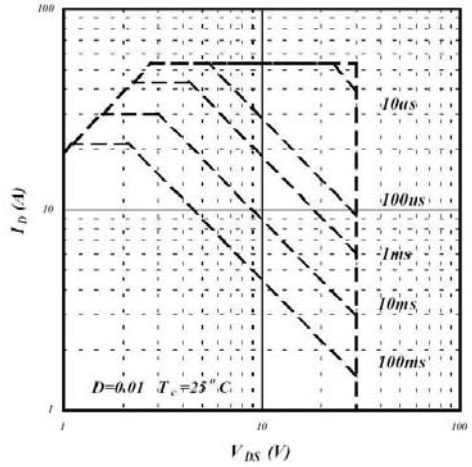


Fig 7. Maximum Safe Operating Area

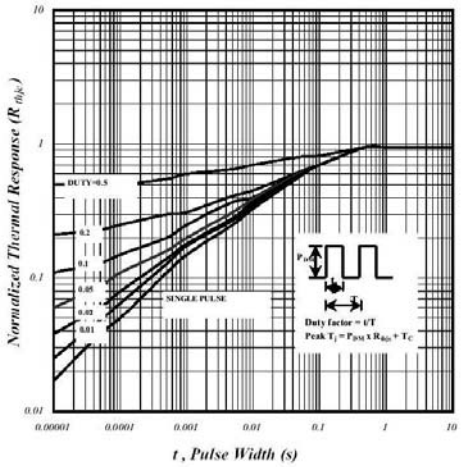


Fig 8. Effective Transient Thermal Impedance

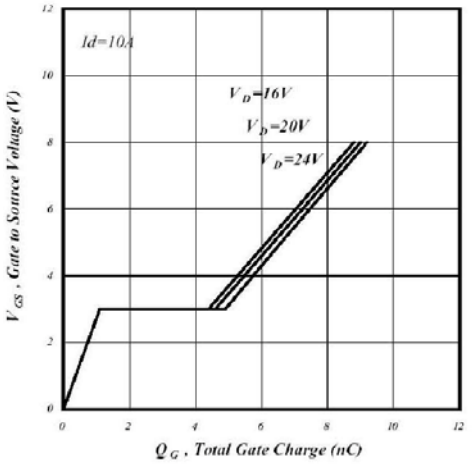


Fig 9. Gate Charge Characteristics

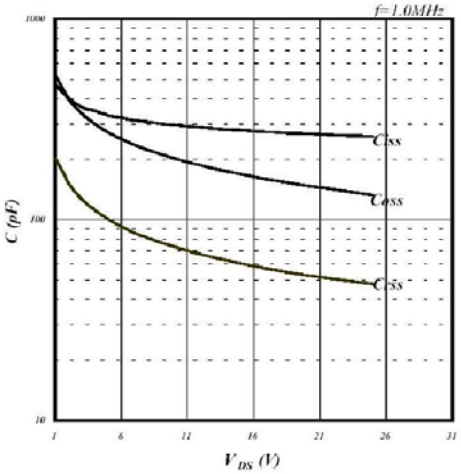


Fig 10. Typical Capacitance Characteristics

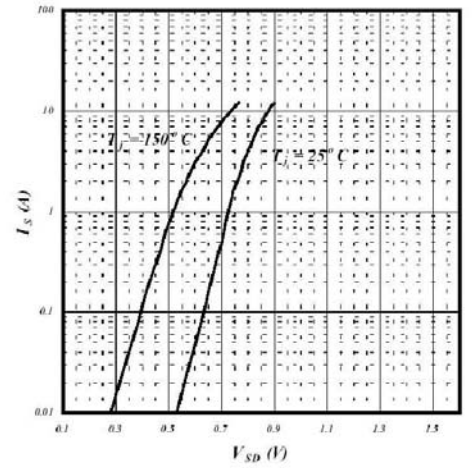


Fig 11. Forward Characteristics of Reverse Diode

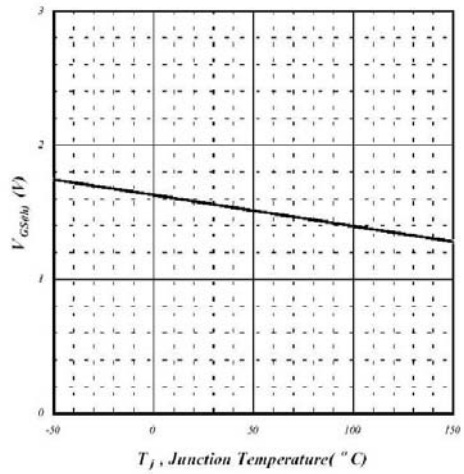


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

CHARACTERISTIC CURVES (cont'd)

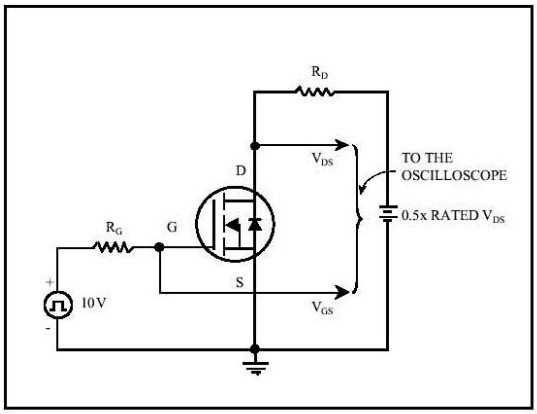


Fig 13. Switching Time Circuit

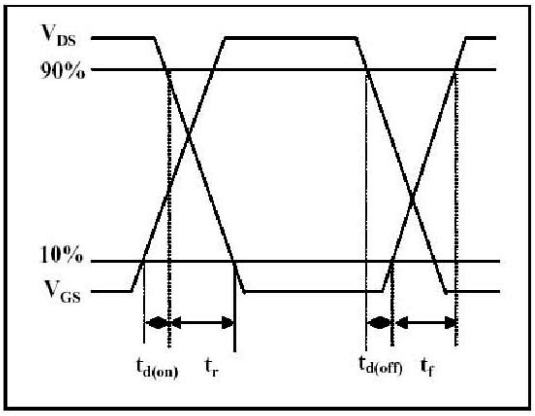


Fig 14. Switching Time Waveform

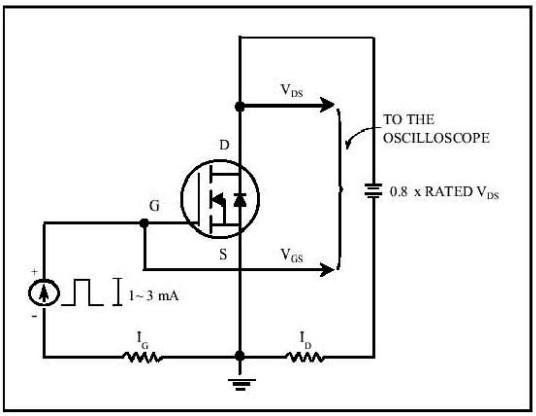


Fig 15. Gate Charge Circuit

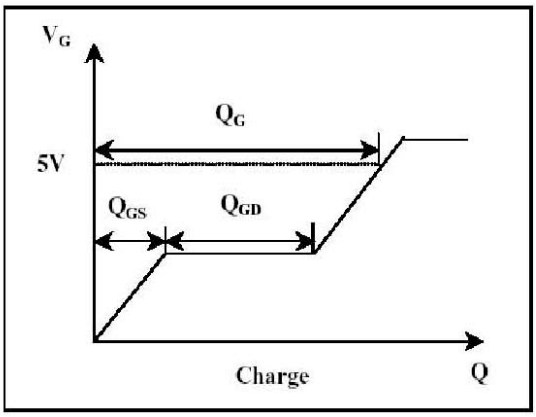


Fig 16. Gate Charge Waveform