SM15N10

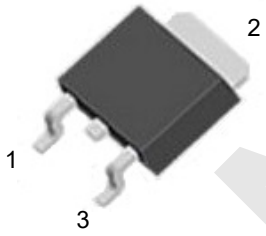
100V N-Channel MOSFET

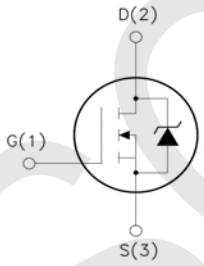
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 11nC (Typ.).
- ☐ BVDSS=100V,I_D= 15A
- ☐ R_{DS}(on) : 0.12Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-252

RoHS COMPLIANT





1. Gate (G)
2. Drain (D)
3. Source (S)

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	15	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	8.1	A
I_{DM}	Pulsed Drain Current[1]	28	A
P_D@T_C=25℃	Total Power Dissipation	20.8	W
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
E_{AS}	Single Pulse Avalanche Energy[4]	8	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
Rthj-c	Maximum Thermal Resistance, Junction-case	6	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	62.5	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=5A	-	-	120	mΩ
		V_{GS}=4.5V, I_D=3A	-	-	135	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=5A	-	17	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=5A	-	11	17.6	nC
Q_{gs}	Gate-Source Charge	V_{DS}=80V	-	2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	2	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V	-	6	-	ns
t_r	Rise Time	I_D=5A	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	14	-	ns
t_f	Fall Time	V_{GS}=10V	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	580	928	pF
C_{oss}	Output Capacitance	V_{DS}=50V	-	27	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	19	-	pF
R_g	Gate Resistance	f=1.0MHz	-	2	4	Ω
V_{SD}	Forward On Voltage[2]	I_S=5A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=5A, V_{GS}=0V, dI/dt=100A/μs	-	20	-	ns
Q_{rr}	Reverse Recovery Charge		-	18	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.
2.Pulse test
3.Surface mounted on 1 in^2 copper pad of FR4 board
4.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω

Typical Characteristics

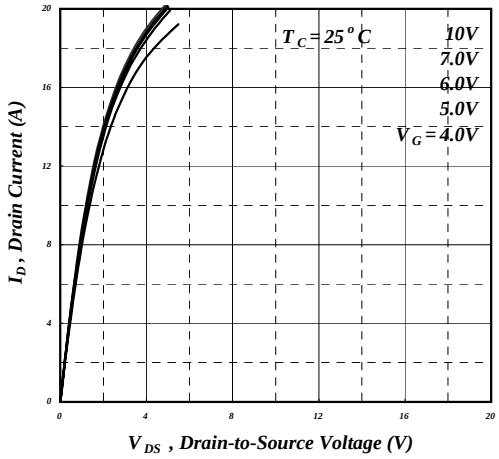


Fig 1. Typical Output Characteristics

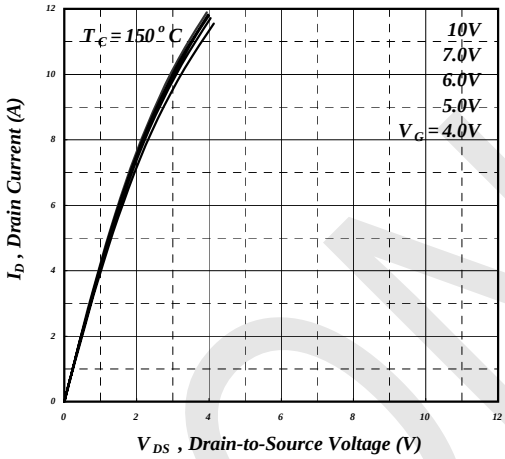


Fig 2. Typical Output Characteristics

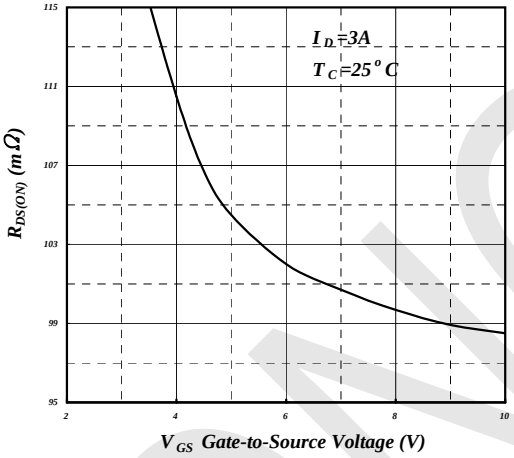


Fig 3. On-Resistance v.s. Gate Voltage

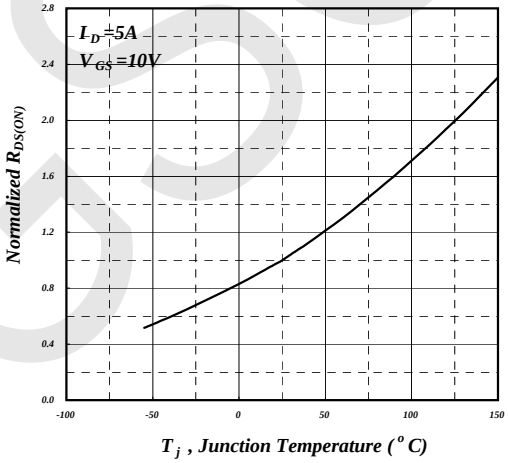


Fig 4. Normalized On-Resistance v.s. Junction Temperature

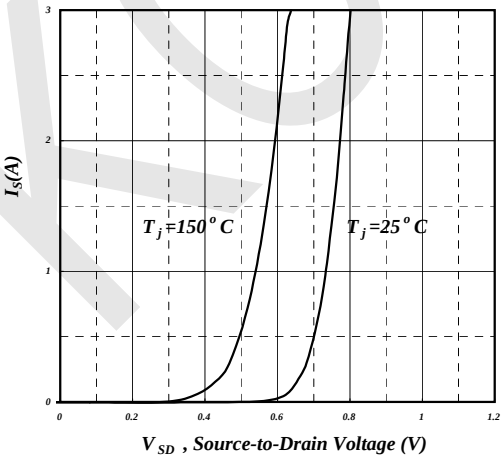


Fig 5. Forward Characteristic of Reverse Diode

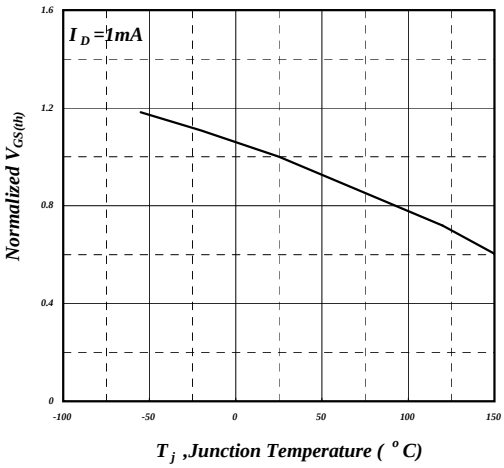


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Characteristics (Continued)

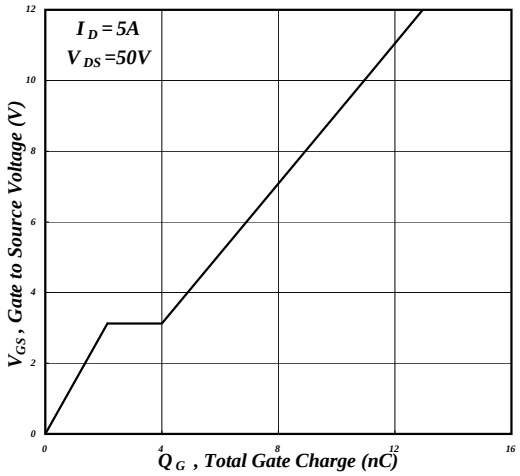


Fig 7. Gate Charge Characteristics

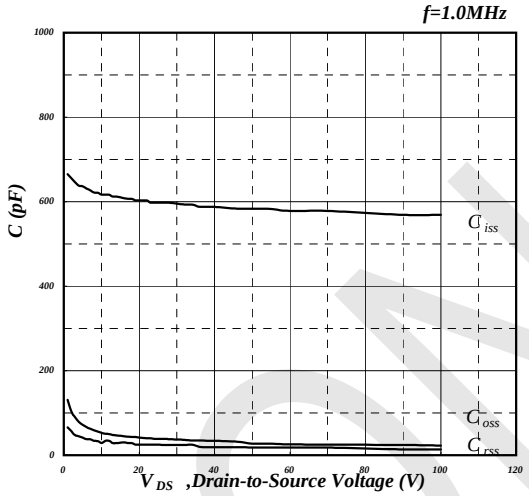


Fig 8. Typical Capacitance Characteristics

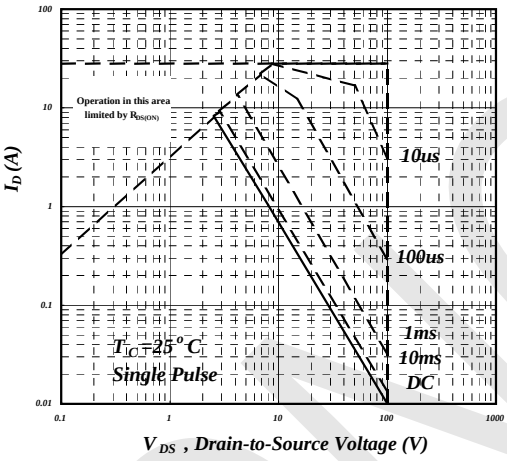


Fig 9. Maximum Safe Operating Area

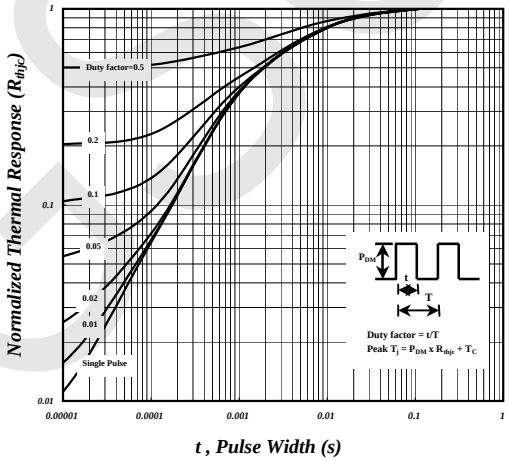


Fig 10. Effective Transient Thermal Impedance

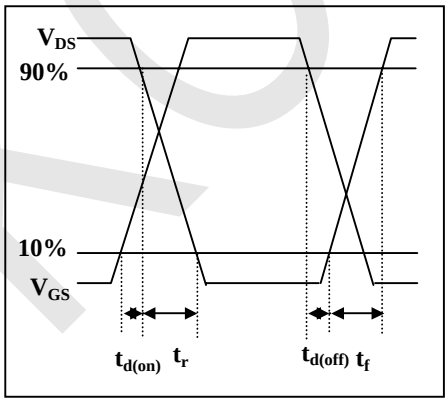


Fig 11. Switching Time Waveform

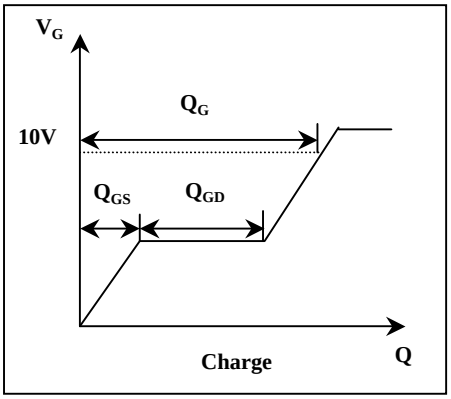


Fig 12. Gate Charge Waveform

Typical Characteristics (Continued)

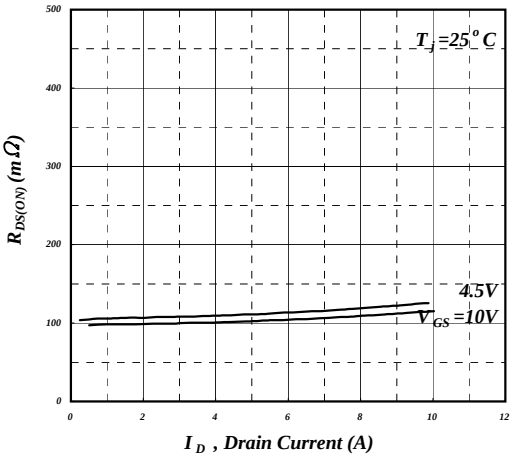


Fig 13. Typ. Drain-Source on State Resistance

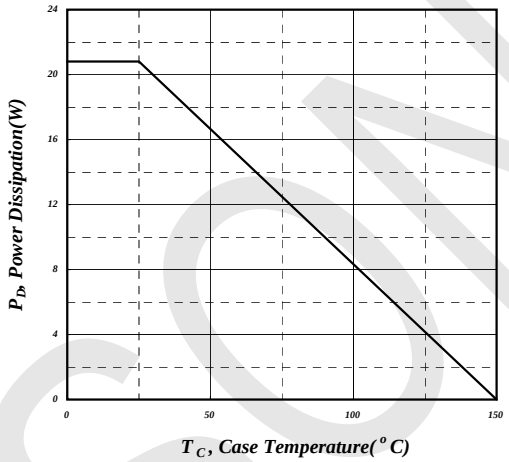


Fig 14. Total Power Dissipation

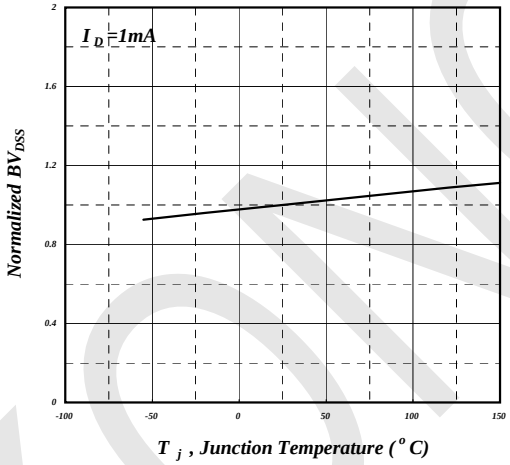


Fig 15. Normalized BV_{DSS} v.s. Junction

Package Dimension

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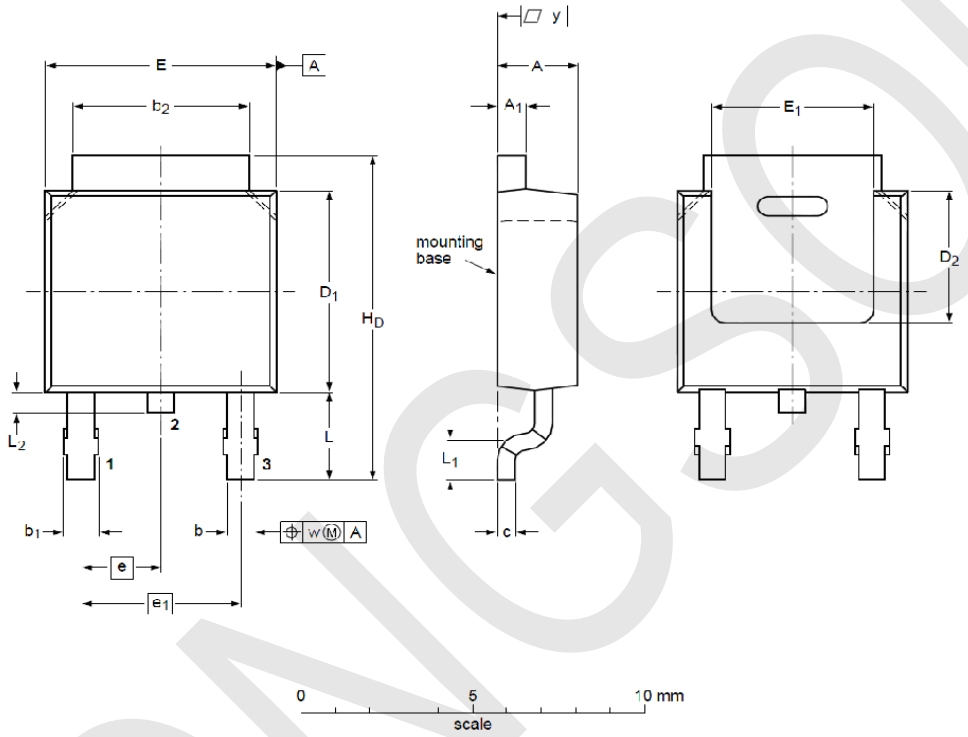

DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.22	2.30	2.38	**A_1**	0.46	0.58	0.93
b	0.71	0.79	0.89	**b_1**	0.90	0.98	1.10
b_2	5.00	5.30	5.46	**c**	0.20	0.40	0.56
D_1	5.98	6.05	6.22	**D_2**	--	4.00	--
E	6.47	6.60	6.73	**E_1**	5.10	5.28	5.45
e	--	2.28	--	**e_1**	--	4.57	--
H_D	9.60	10.08	10.40	**L**	2.75	2.95	3.05
L_1	--	0.50	--	**L_2**	0.80	0.90	1.10
w	--	0.20	--	**y**	0.20	--	--