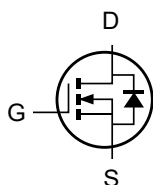
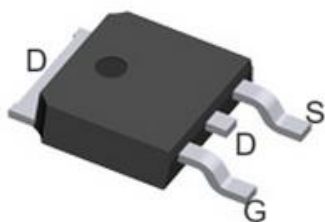


N-Channel Advanced Trench MOSFET

MSR4R8N03D

TO-252



Features

- Advanced Trench Technology
- Excellent RDS(ON) and Low Gate Charge
- Lead Free

Applications

- DC/DC Converter
- Battery Protection Charge/Discharge
- Load switch
- Synchronous Rectification

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V _{(BR)DSS}	Drain-Source breakdown voltage		30	V
V _{GS}	Gate-Source voltage		±20	V
I _D	Continuous drain current	T _C =25°C	100	A
		T _C =100°C	70	A
I _{DM}	Pulse drain current tested	T _C =25°C	380	A
EAS	Avalanche energy, single pulsed ①		108	mJ
PD	Maximum power dissipation	T _C =25°C	62	W
T _{STG} , T _J	Storage and Junction Temperature Range		-55 to 150	°C

^①.E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_G = 10\text{V}$, $R_G = 25\text{ohm}$, $L = 0.5\text{mH}$, $I_{AS} = 20\text{A}$, $V_{DD} = 0\text{V}$ during time in avalanche.

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.8	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Static Electrical Characteristics @T_j=25°C (unless otherwise stated)

V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	3.0	4.8	mΩ
		V _{GS} =4.5V, I _D =15A	--	4.2	6.5	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V , f=1MHz	--	2245	--	pF
C _{oss}	Output Capacitance		--	260	--	pF
C _{rss}	Reverse Transfer Capacitance		--	215	--	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =30A , V _{GS} =0V to 10V	--	43	--	nC
Q _{gs}	Gate-Source Charge		--	7	--	nC
Q _{gd}	Gate-Drain Charge		--	10	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =15V, V _{GS} =10V I _D =30A, R _G =3Ω,	--	8	--	ns
Tr	Turn-on Rise Time		--	15	--	ns
Td(off)	Turn-Off Delay Time		--	39	--	ns
Tf	Turn-Off Fall Time		--	12	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

VSD	Forward on voltage	I _{SD} =30A, V _{GS} =0V	--	--	1.2	V
I _S	Body Diode Forward Current	--	--	--	100	A
T _{rr}	Body Diode Reverse Recovery Time	I _{SD} =20A, d _i /d _t =100A/μs	--	12	--	ns
Q _{rr}	Body Diode Reverse Recovery Charge		--	3.5	--	nC

Typical Characteristics

Figure 1: Power De-rating

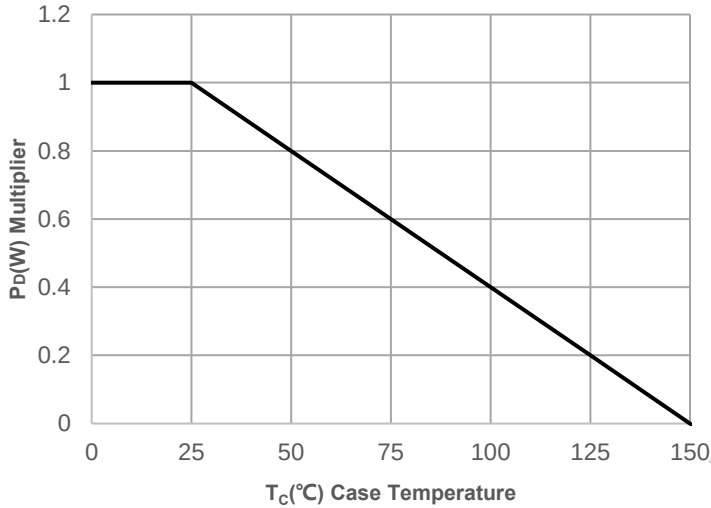


Figure 2: Current De-rating

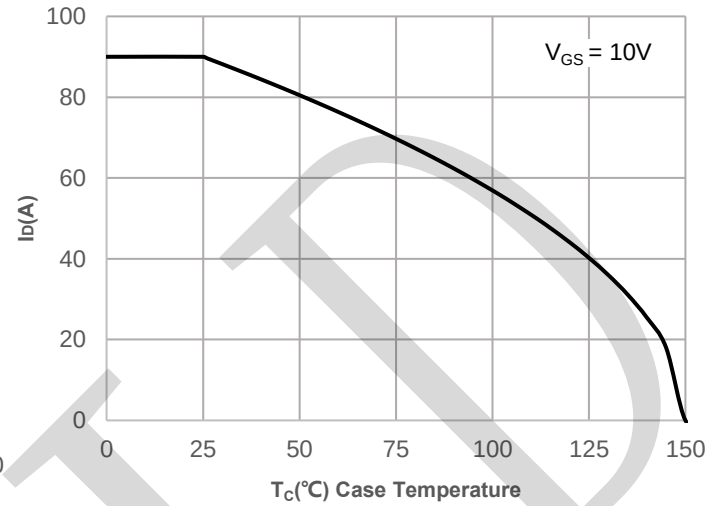
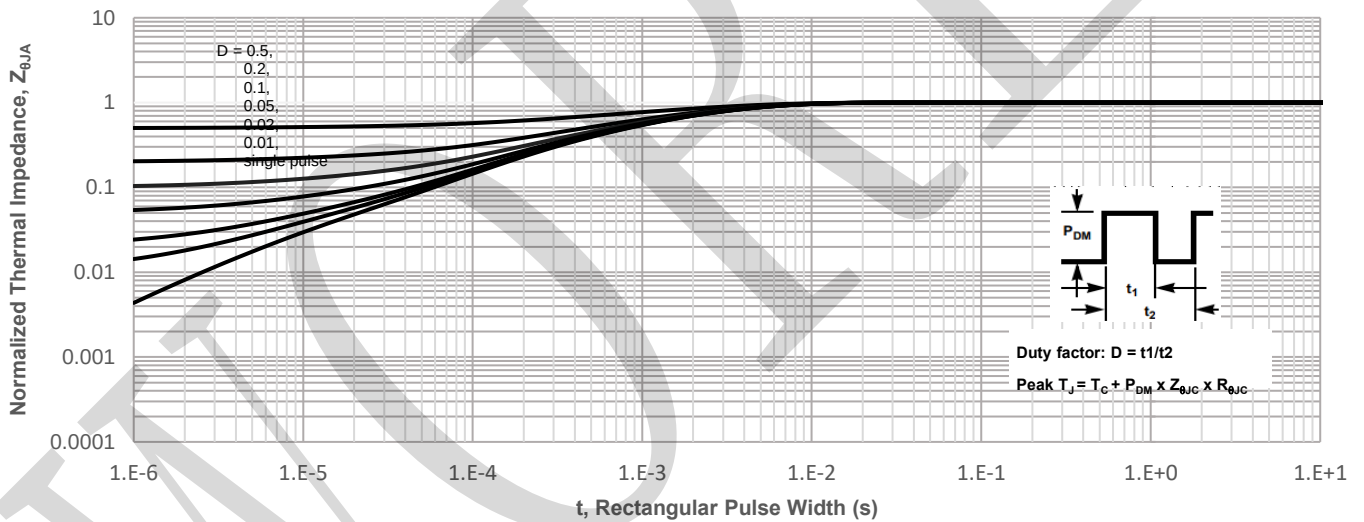


Figure 3: Normalized Maximum Transient Thermal Impedance



Typical Characteristics

Figure 4: Output Characteristics

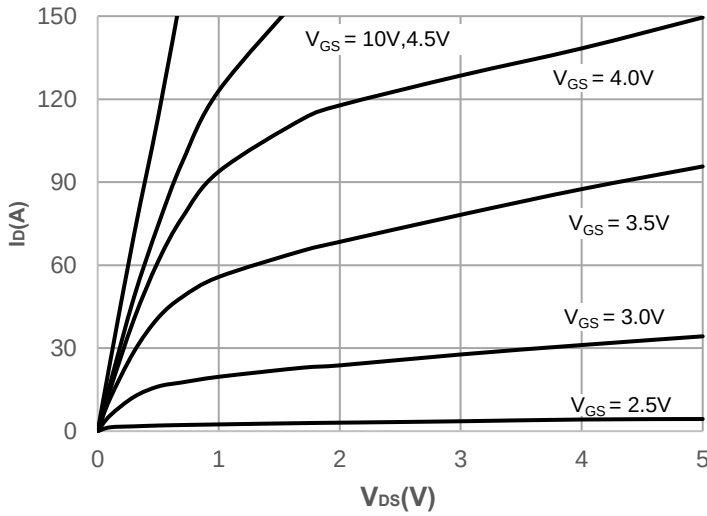


Figure 5: Typical Transfer Characteristics

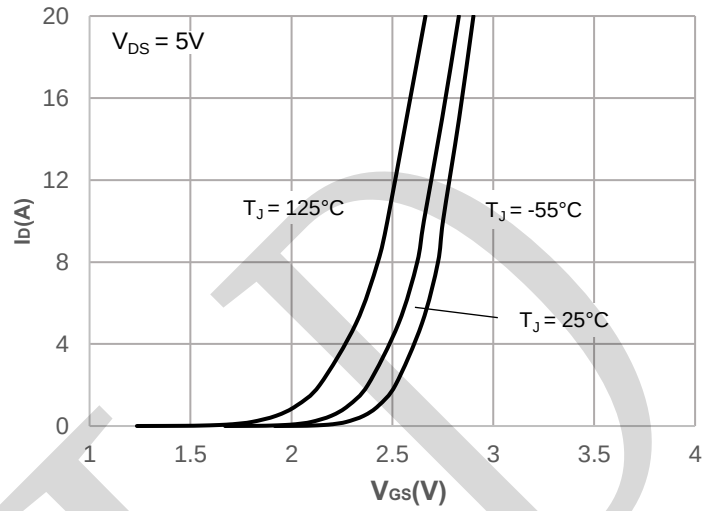


Figure 6: On-resistance vs. Drain Current

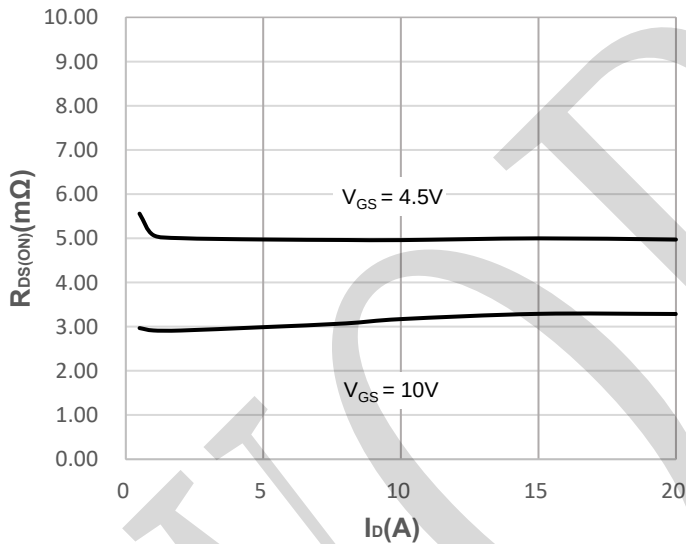


Figure 7: Body Diode Characteristics

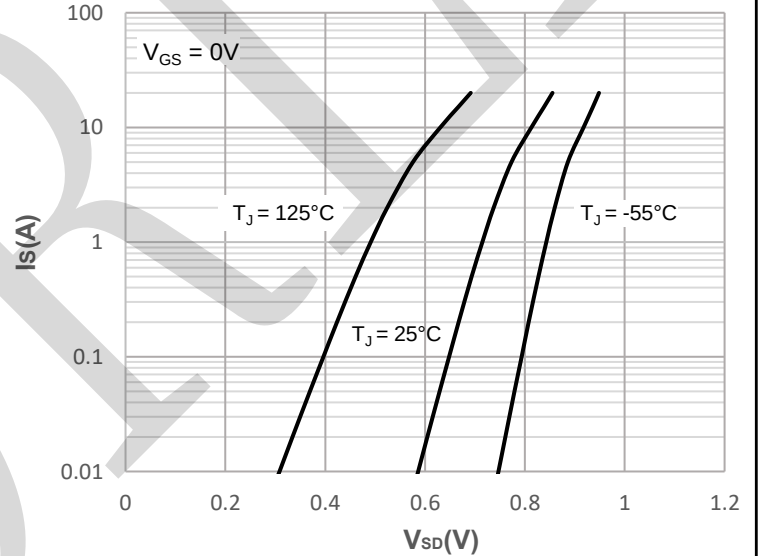


Figure 8: Gate Charge Characteristics

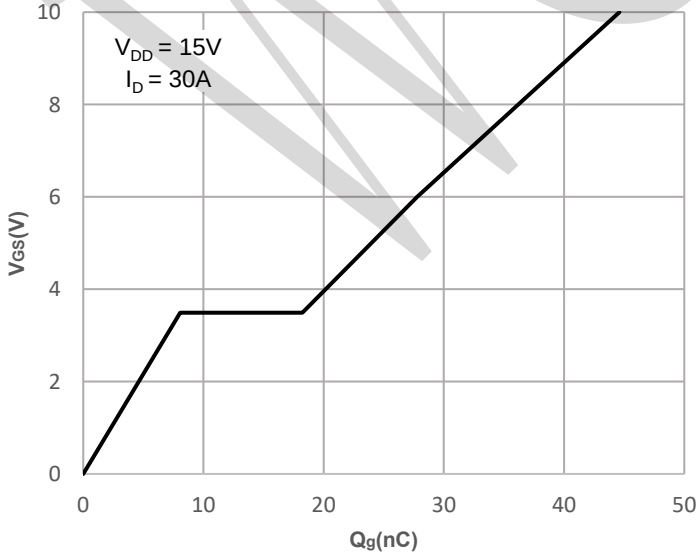
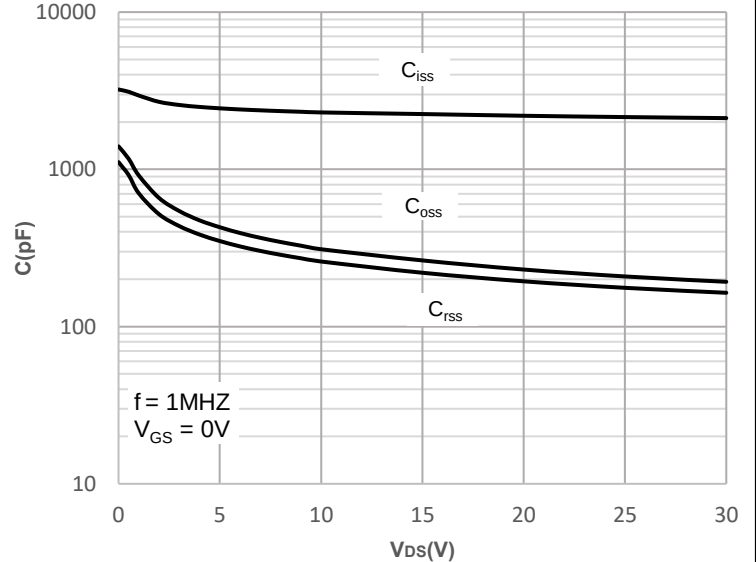


Figure 9: Capacitance Characteristics



Typical Characteristics

Figure 10: Normalized Breakdown voltage vs. Junction Temperature

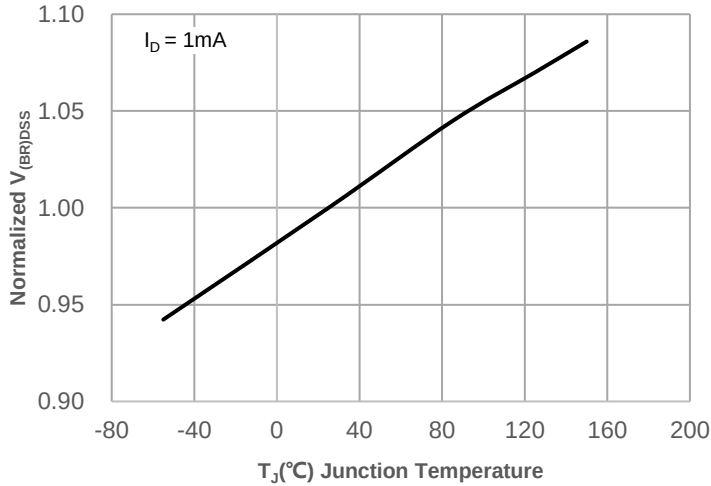


Figure 11: Normalized on Resistance vs. Junction Temperature

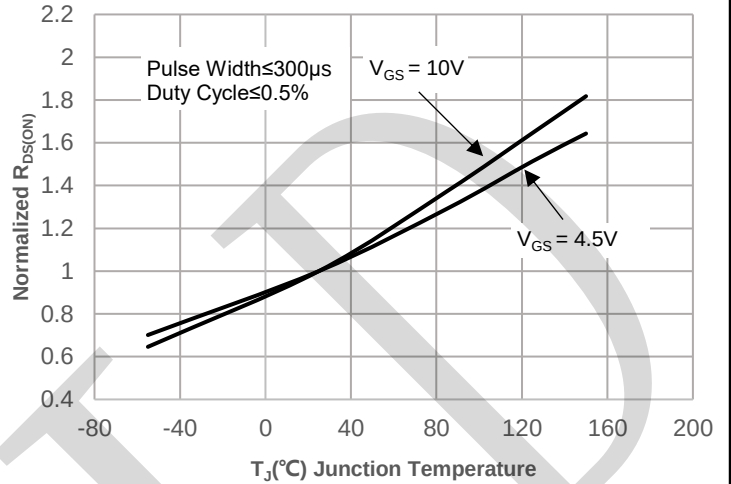


Figure 12: Normalized Threshold Voltage vs. Junction Temperature

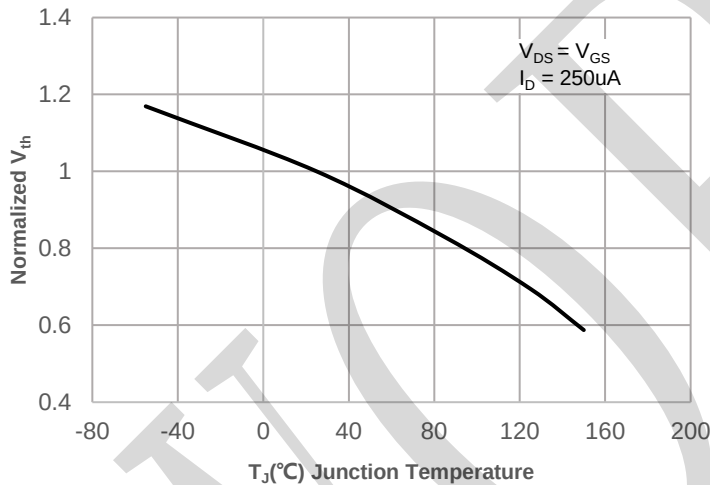


Figure 13: $R_{DS(ON)}$ vs. V_{GS}

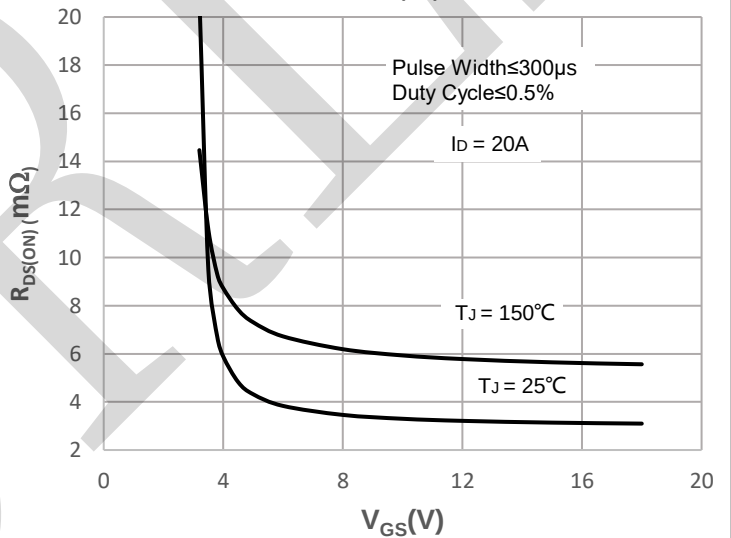
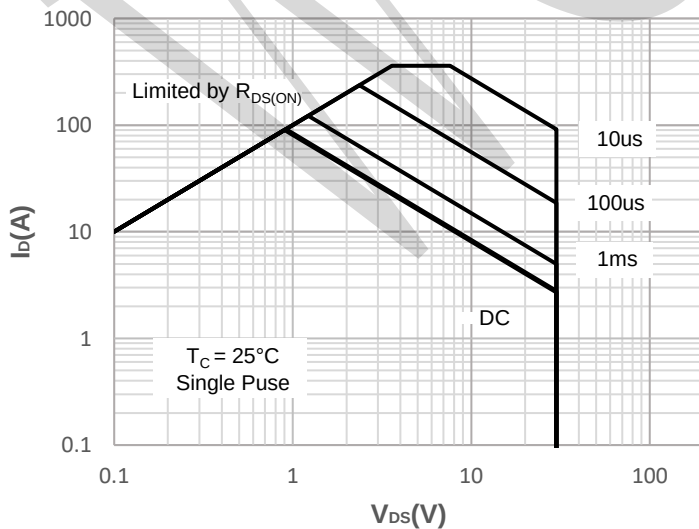


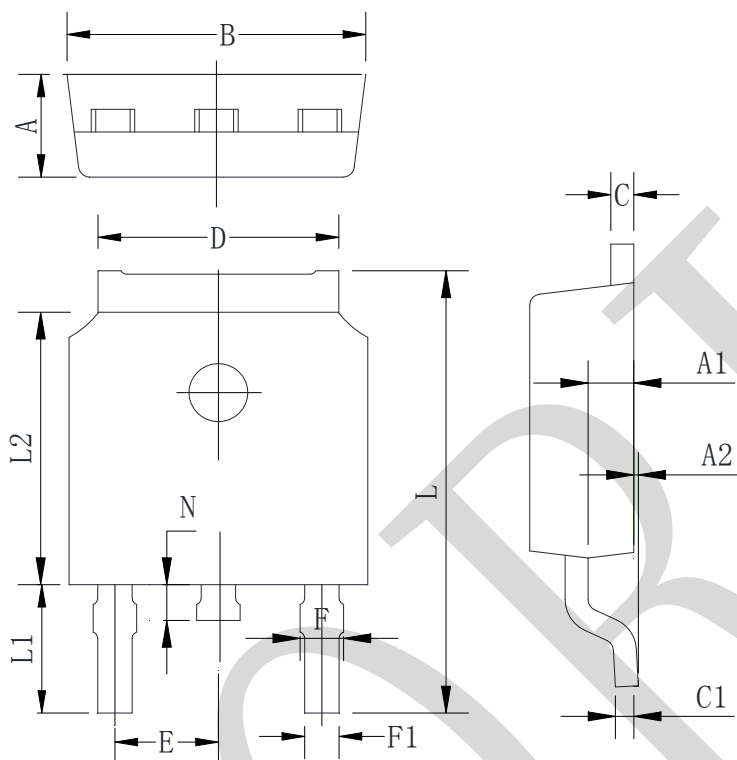
Figure 14: Maximum Safe Operating Area



PACKAGE OUTLINE DIMENSIONS

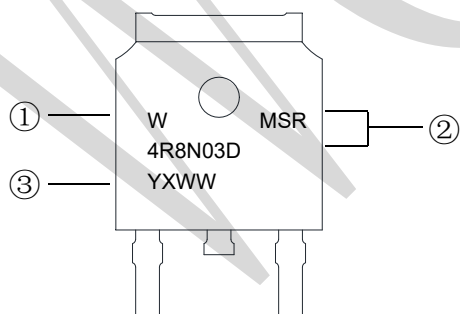
Note:unit mm

TO-252



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.910	1.010	1.110
A2	0.050	0.150	0.250
B	6.500	6.600	6.700
C	0.460	0.500	0.580
C1	0.460	0.500	0.580
D	5.120	5.320	5.520
E	2.286 TYP		
F	0.780	0.860	1.020
F1	0.660	0.760	0.860
L	9.600	10.00	10.20
L1	2.600	2.800	3.000
L2	6.000	6.100	6.200
N	0.600	6.800	1.000

Marking Information



① W : Company's trademark

② Product model : MSR4R803D

③ PDC information :

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)