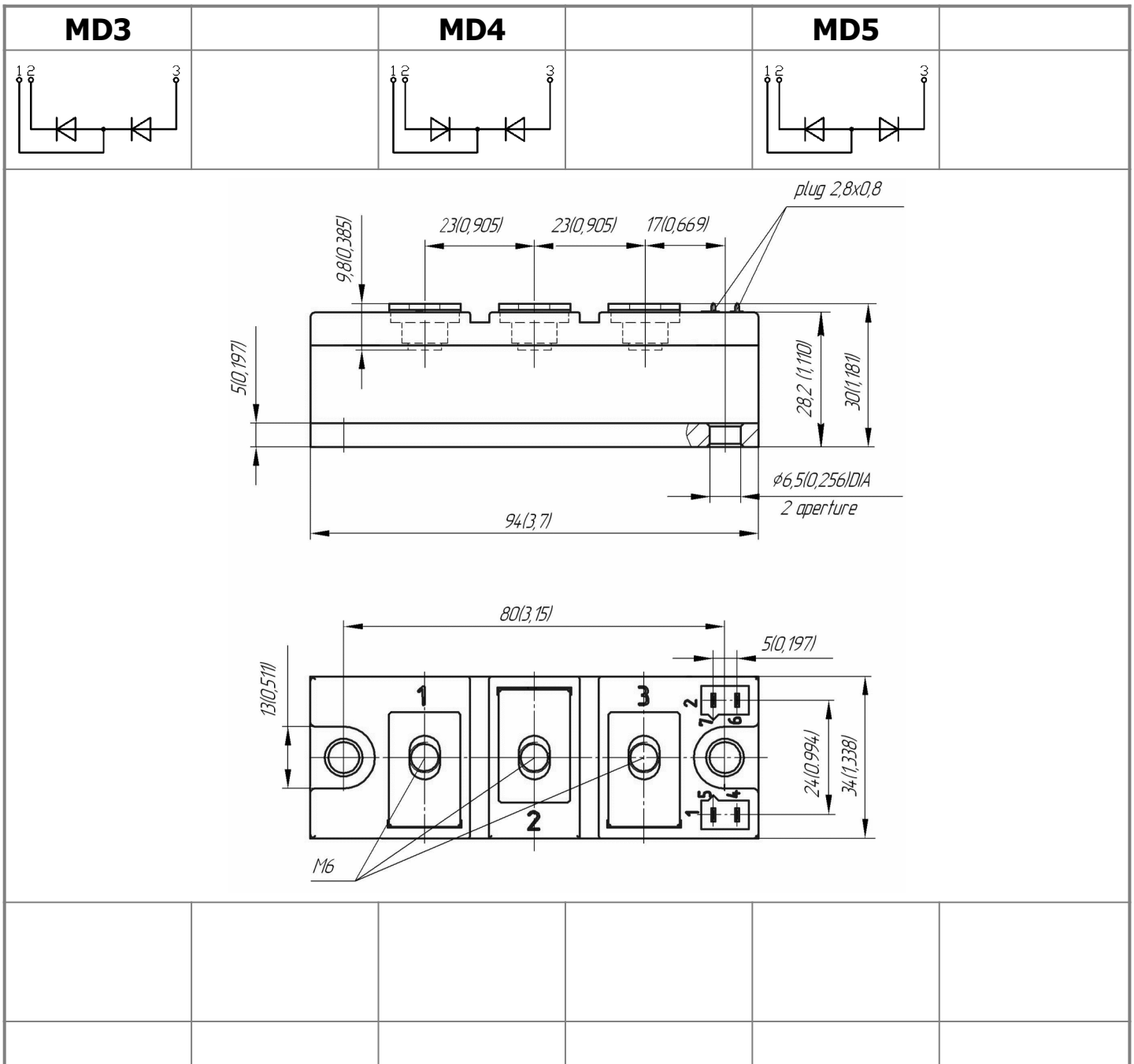




Electrically isolated base plate
Industrial standard package
Simplified mechanical design, rapid assembly
Pressure contact

**Double Diode Module
For Phase Control
MDx-245-18-F**

Average forward current				I_{FAV}	245 A			
Repetitive peak reverse voltage				V_{RRM}	1000 ÷ 1800 V			
V_{RRM}, V	1000	1100	1200	1300	1400	1500	1600	1800
Voltage code	10	11	12	13	14	15	16	18
$T_j, ^\circ C$	- 40 ÷ 150							



All dimensions in millimeters (inches)


MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{FAV}	Average forward current	A	245	$T_c = 100\text{ }^\circ\text{C}$;
I_{FRMS}	RMS forward current	A	385	180° half-sine wave; 50 Hz
I_{FSM}	Surge forward current	kA	8.1 9.5	$T_j = T_{j\text{ max}}$ $T_j = 25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p = 10\text{ ms}$; single pulse; $V_R = 0\text{ V}$;
			8.5 10.0	$T_j = T_{j\text{ max}}$ $T_j = 25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p = 8.3\text{ ms}$; single pulse; $V_R = 0\text{ V}$;
I^2t	Safety factor	$A^2s \cdot 10^3$	320 450	$T_j = T_{j\text{ max}}$ $T_j = 25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p = 10\text{ ms}$; single pulse; $V_R = 0\text{ V}$;
			290 410	$T_j = T_{j\text{ max}}$ $T_j = 25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p = 8.3\text{ ms}$; single pulse; $V_R = 0\text{ V}$;
BLOCKING				
V_{RRM}	Repetitive peak reverse voltages	V	1000÷1800	$T_{j\text{ min}} < T_j < T_{j\text{ max}}$; 180° half-sine wave; 50 Hz;
V_{RSM}	Non-repetitive peak reverse voltages	V	1100÷1900	$T_{j\text{ min}} < T_j < T_{j\text{ max}}$; 180° half-sine wave; single pulse;
V_R	Reverse continuous voltages	V	$0.6 \cdot V_{RRM}$	$T_j = T_{j\text{ max}}$;
THERMAL				
T_{stg}	Storage temperature	$^\circ\text{C}$	- 40 ÷ 50	
T_j	Operating junction temperature	$^\circ\text{C}$	- 40 ÷ 150	
$T_{c\text{ op}}$	Operating temperature	$^\circ\text{C}$	- 40 ÷ 125	
MECHANICAL				
a	Acceleration under vibration	m/s^2	50	

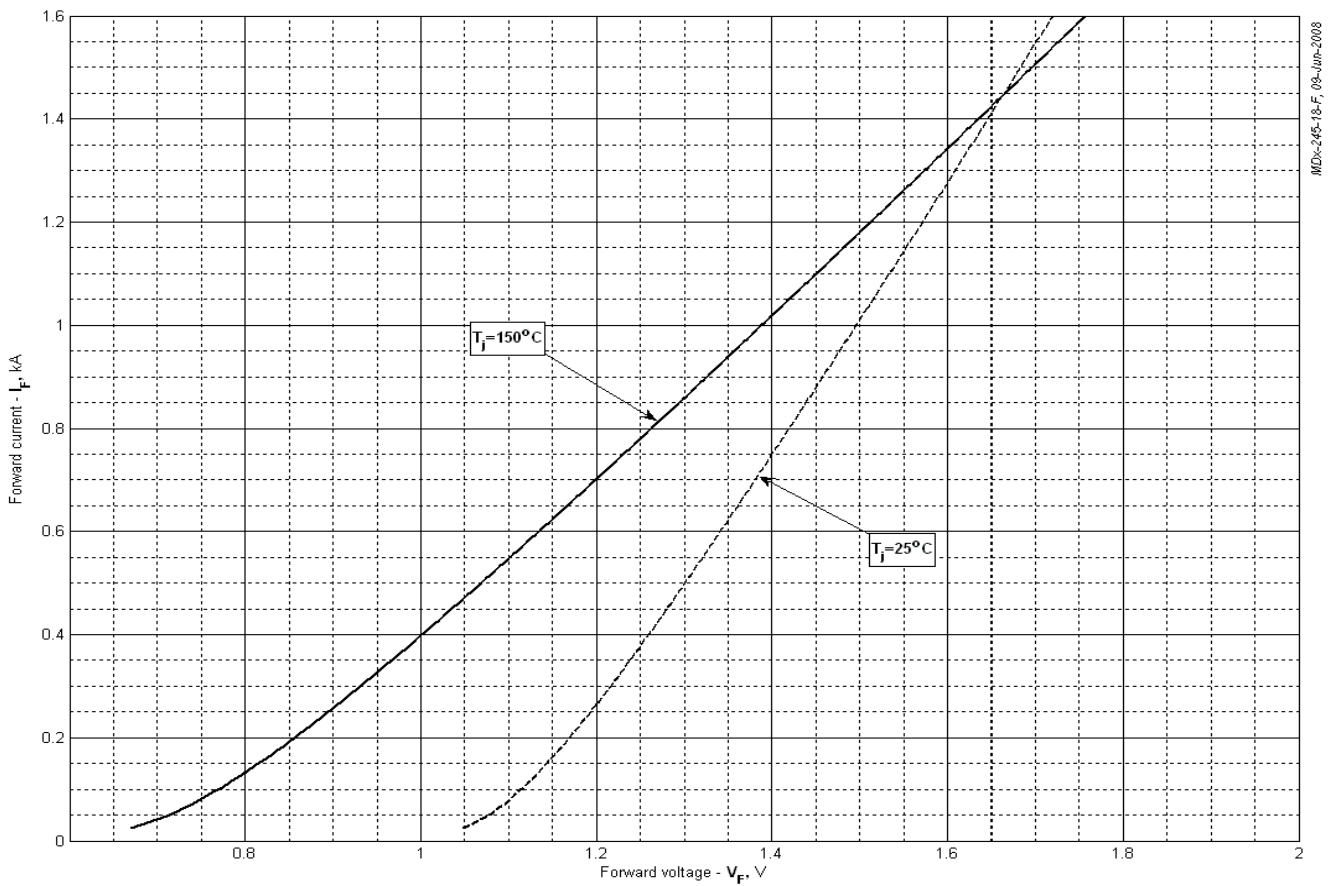
CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions
ON-STATE				
V_{FM}	Peak forward voltage, max	V	1.30	$T_j = 25\text{ }^\circ\text{C}$; $I_{FM} = 500\text{ A}$
$V_{F(TO)}$	Forward threshold voltage, max	V	0.75	$T_j = T_{j\text{ max}}$;
r_T	Forward slope resistance, max	$\text{m}\Omega$	0.640	$0.5 \pi I_{FAV} < I_T < 1.5 \pi I_{FAV}$
BLOCKING				
I_{RRM}	Repetitive peak reverse current, max	mA	20	$T_j = T_{j\text{ max}}$; $V_R = V_{RRM}$
SWITCHING				
Q_{rr}	Total recovered charge, max	μC	585	$T_j = T_{j\text{ max}}$; $I_{FM} = 200\text{ A}$;
t_{rr}	Reverse recovery time, max	μs	13	$di_R/dt = -10\text{ A}/\mu\text{s}$;
I_{rrM}	Peak reverse recovery current, max	A	90	$V_R = 100\text{ V}$;
THERMAL				
R_{thjc}	Thermal resistance, junction to case			
	per module	$^\circ\text{C}/\text{W}$	0.0900	180° half-sine wave, 50 Hz
	per arm	$^\circ\text{C}/\text{W}$	0.1800	
	per module	$^\circ\text{C}/\text{W}$	0.0850	DC
per arm	$^\circ\text{C}/\text{W}$	0.1700		
R_{thch}	Thermal resistance, case to heatsink			
	per module	$^\circ\text{C}/\text{W}$	0.0300	
	per arm	$^\circ\text{C}/\text{W}$	0.0600	

INSULATION					
V _{ISOL}	Insulation test voltage	kV	3.00	Sine wave, 50 Hz; RMS	t=60 sec
			3.60		t=1 sec
MECHANICAL					
M ₁	Mounting torque (M6) ¹⁾	Nm	6.00	Tolerance ± 15%	
M ₂	Terminal connection torque (M6) ¹⁾	Nm	6.00	Tolerance ± 15%	
w	Weight, max	g	350		

PART NUMBERING GUIDE						NOTES					
MD	3	-	245	-	18	-	F	-	N		¹⁾ The screws must be lubricated
1	2		3		4		5		6		
1. MD - Rectifier Diode 2. Circuit Schematic 3. Average Forward Current, A 4. Voltage Code 5. Package Type (M.F) 6. Ambient Conditions: N – Normal											
		UL certified file-No. E255404									

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MDx-245-18-F, 03-Jun-2008

Fig 1 – On-state characteristics of Limit device

Analytical function for On-state characteristic:

$$V_F = A + B \cdot i_F + C \cdot \ln(i_F + 1) + D \cdot \sqrt{i_F}$$

	Coefficients for max curves	
	$T_j = 25^\circ\text{C}$	$T_j = T_{j\text{max}}$
A	0.997281	0.595210
B	0.333859	0.559089
C	-0.245214	-0.348072
D	0.334485	0.474789

On-state characteristic model (see Fig. 1)

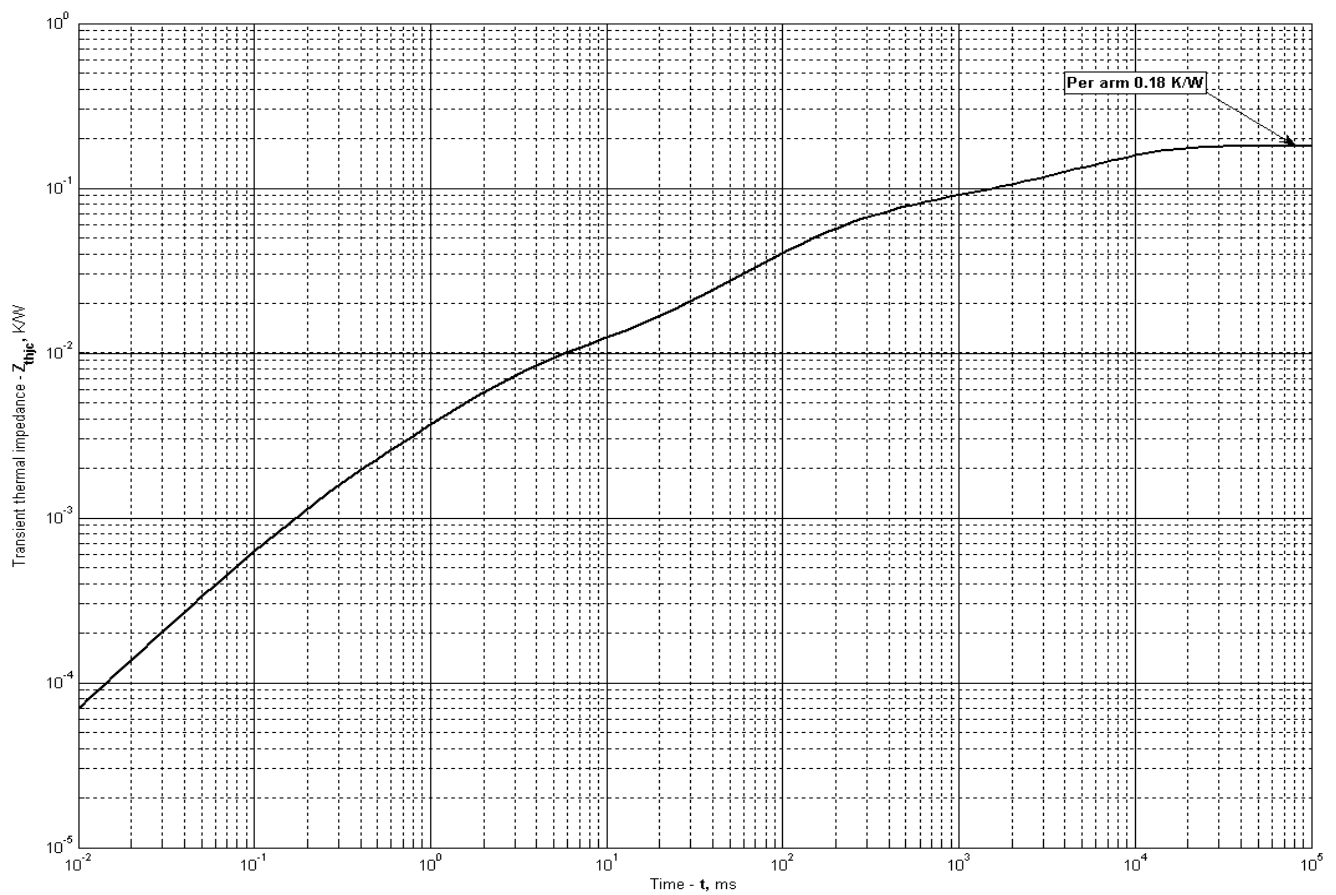


Fig 2 – Transient thermal impedance

Analytical function for Transient thermal impedance junction to case Z_{thjc} for DC:

$$Z_{thjc} = \sum_{i=1}^n R_i \left(1 - e^{-\frac{t}{\tau_i}} \right)$$

Where $i = 1$ to n , n is the number of terms in the series.

t = Duration of heating pulse in seconds.

Z_{thjc} = Thermal resistance at time t .

R_i = Amplitude of p_{th} term.

τ_i = Time constant of r_{th} term.

i	1	2	3	4	5	6
R_i , K/W	0.0007653	0.00703	0.01629	0.04126	0.01513	0.09951
τ_i , s	0.0002111	0.002366	0.06905	0.1909	0.6646	6.64

Transient thermal impedance junction to case Z_{thjc} model (see Fig. 2)

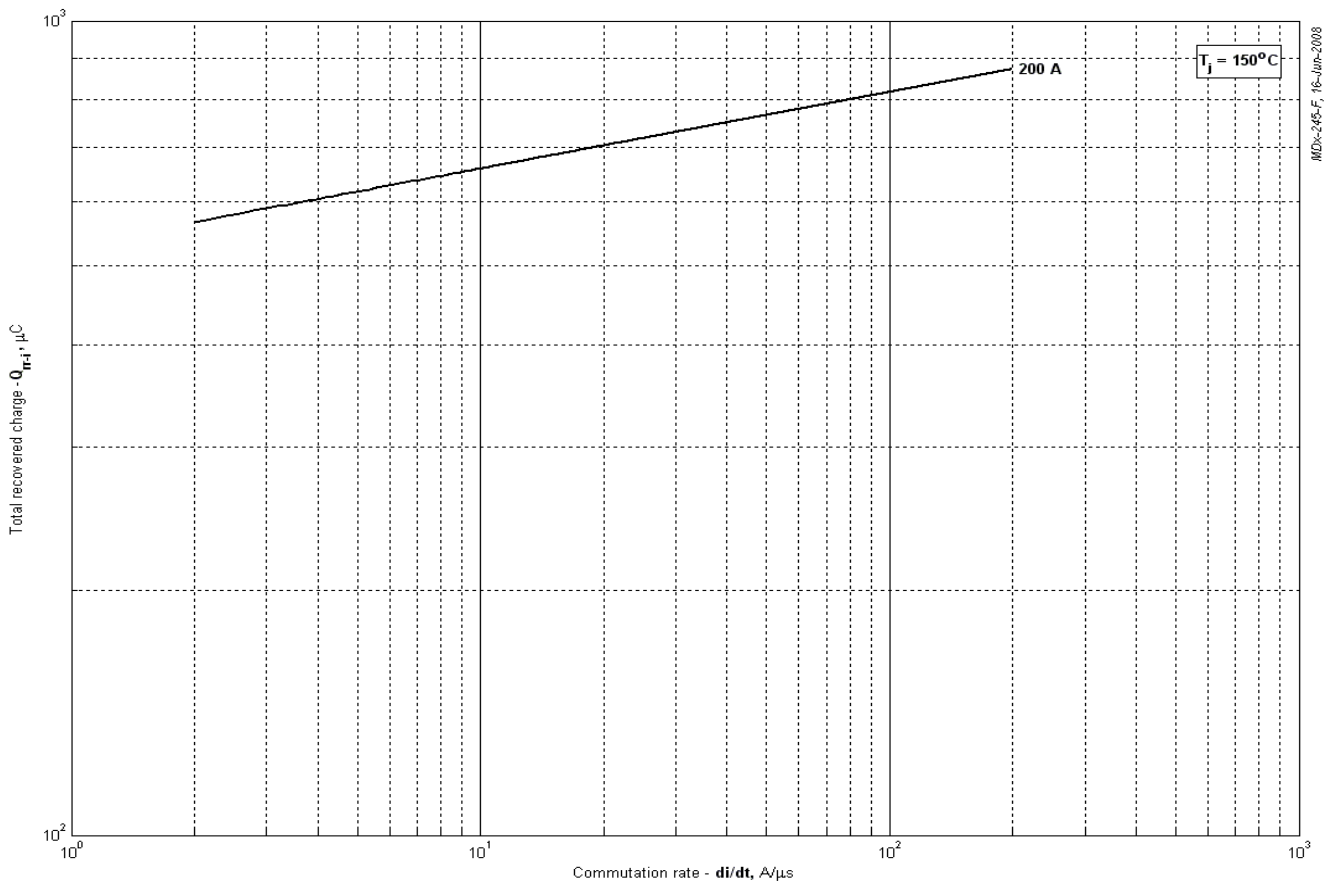


Fig 3 – Total recovered charge, Q_{rr-i} (integral)

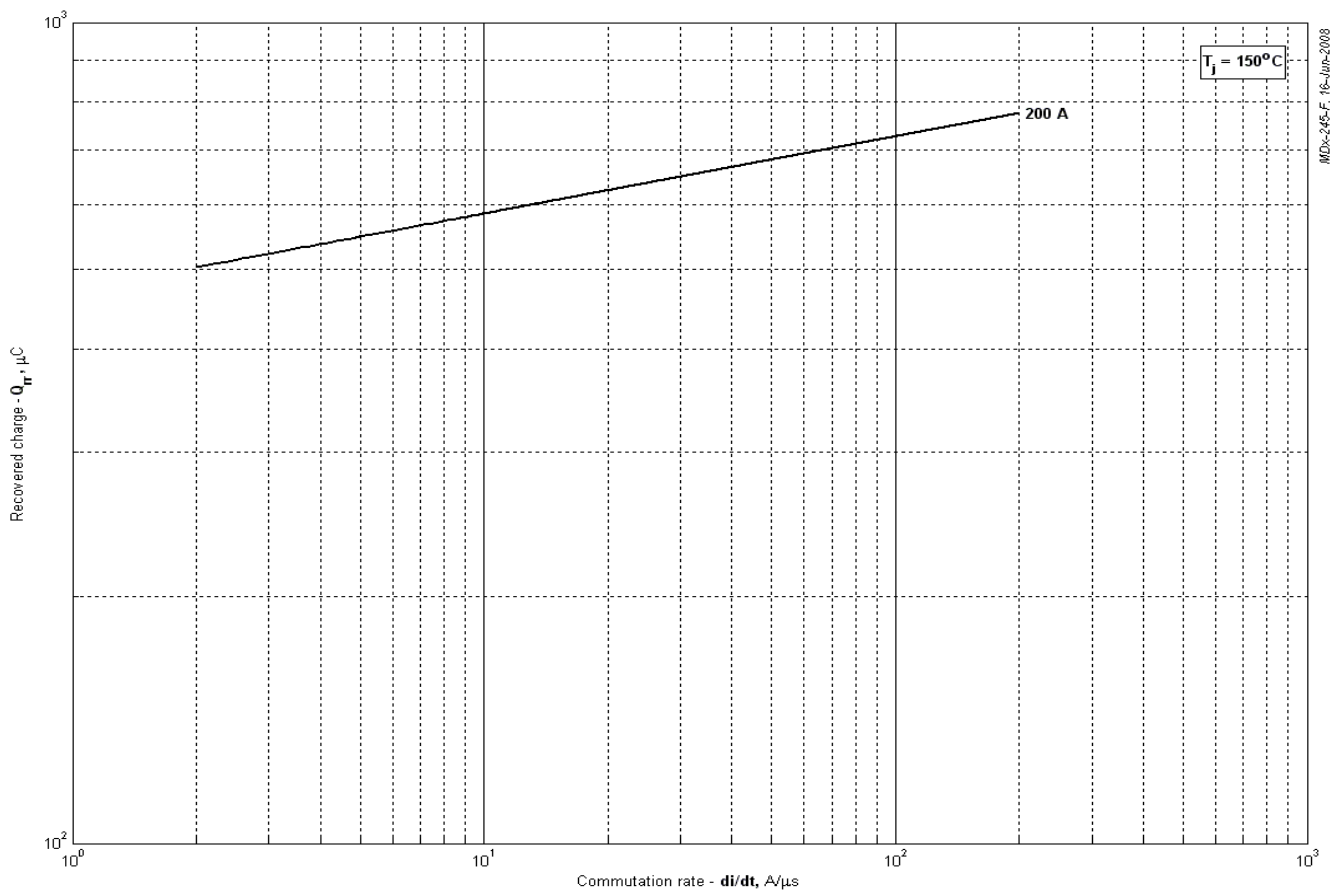


Fig 4 - Recovered charge, Q_{rr} (25% chord)

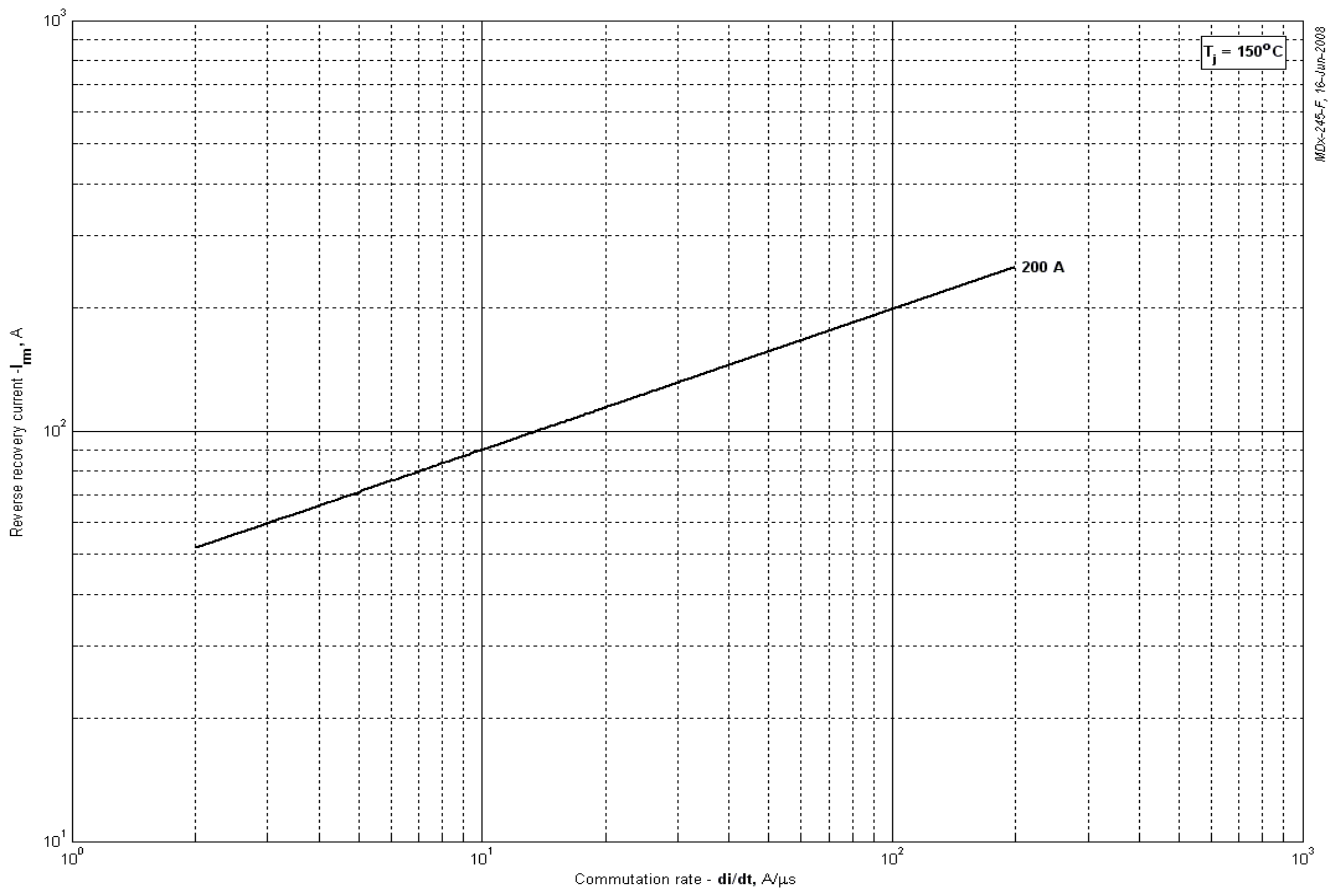


Fig 5 – Peak reverse recovery current, I_{rm}

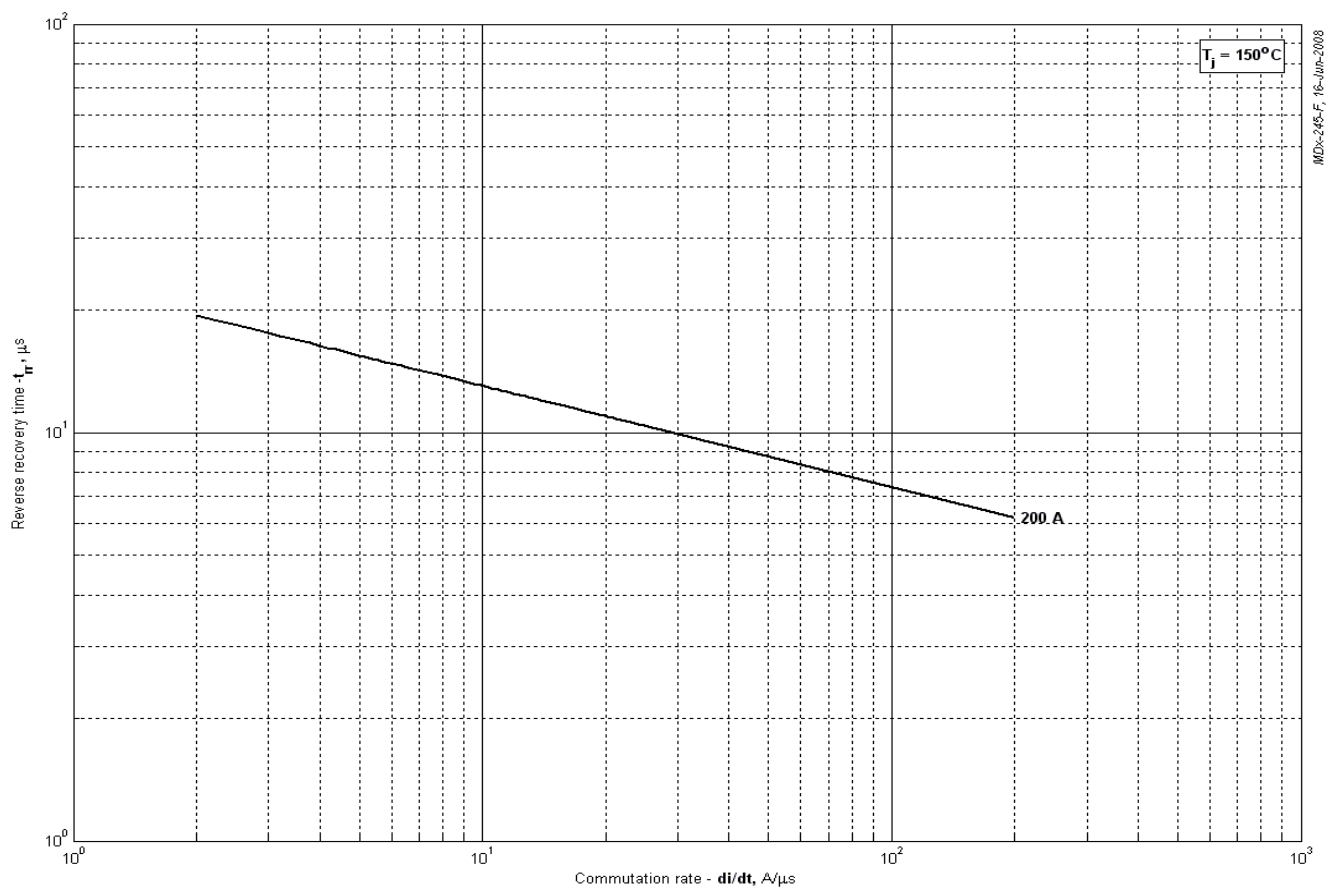


Fig 6 – Maximum recovery time, t_{rr} (25% chord)

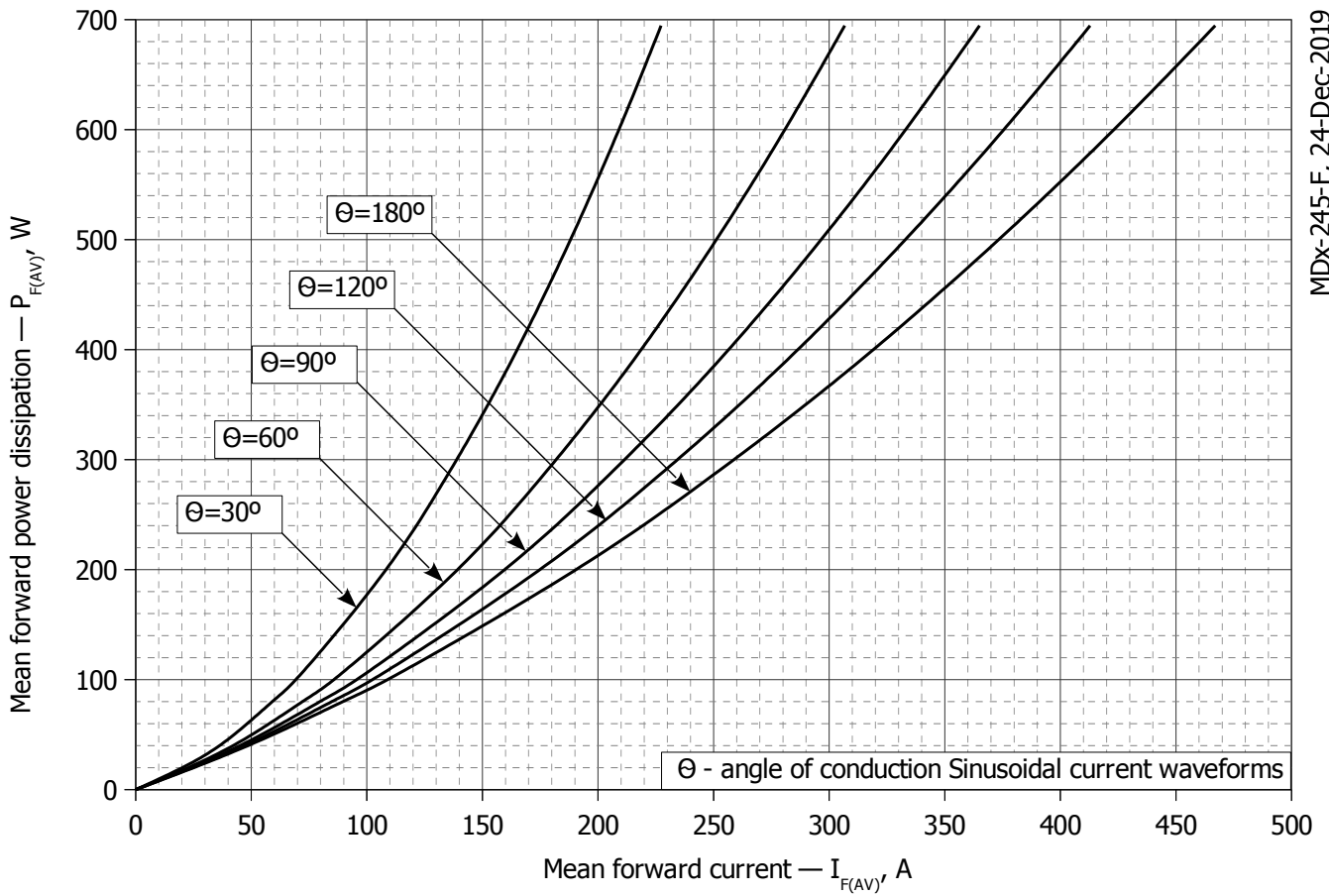


Fig 7 – On-state power loss (sinusoidal current waveforms)

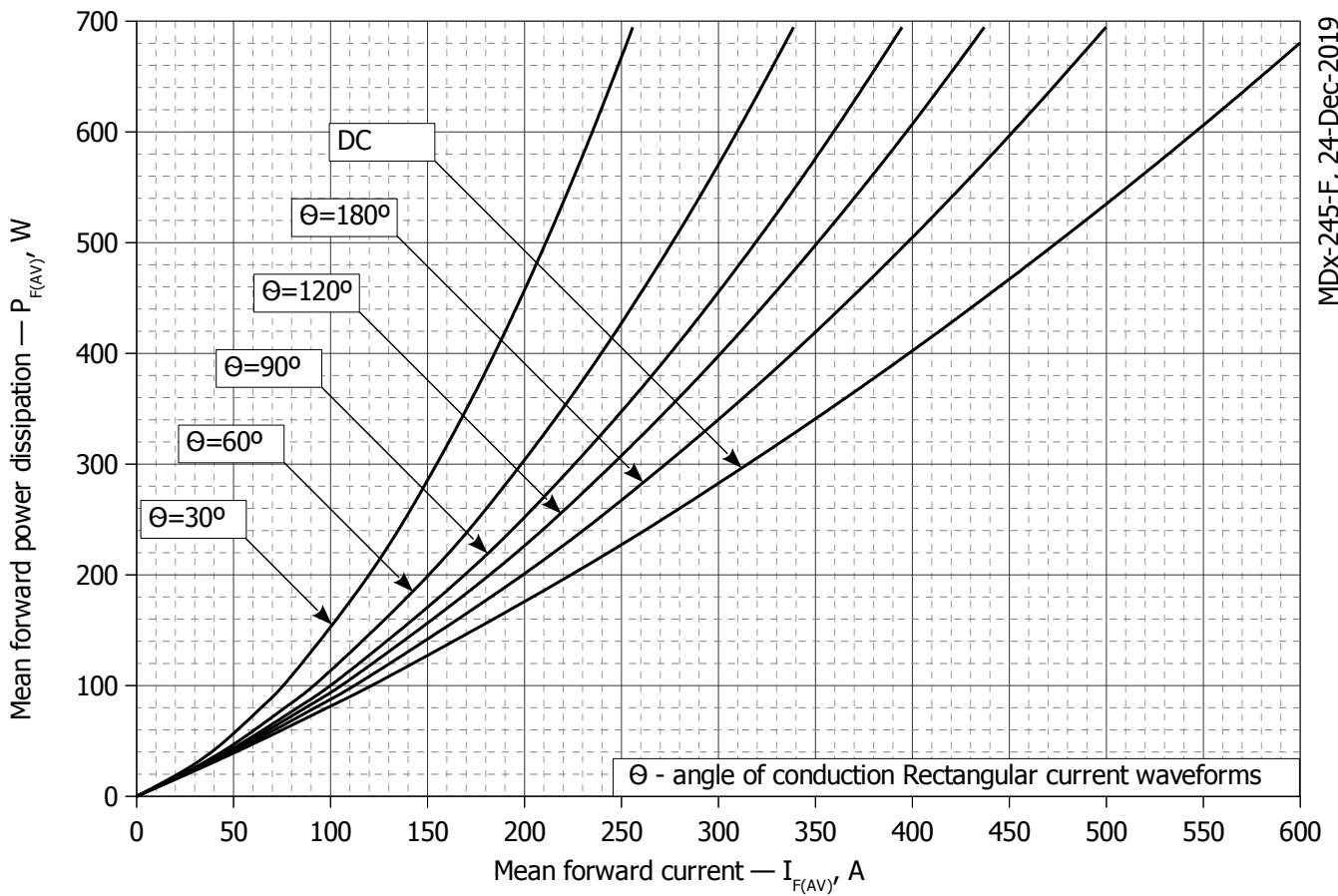


Fig 8 – On-state power loss (rectangular current waveforms)

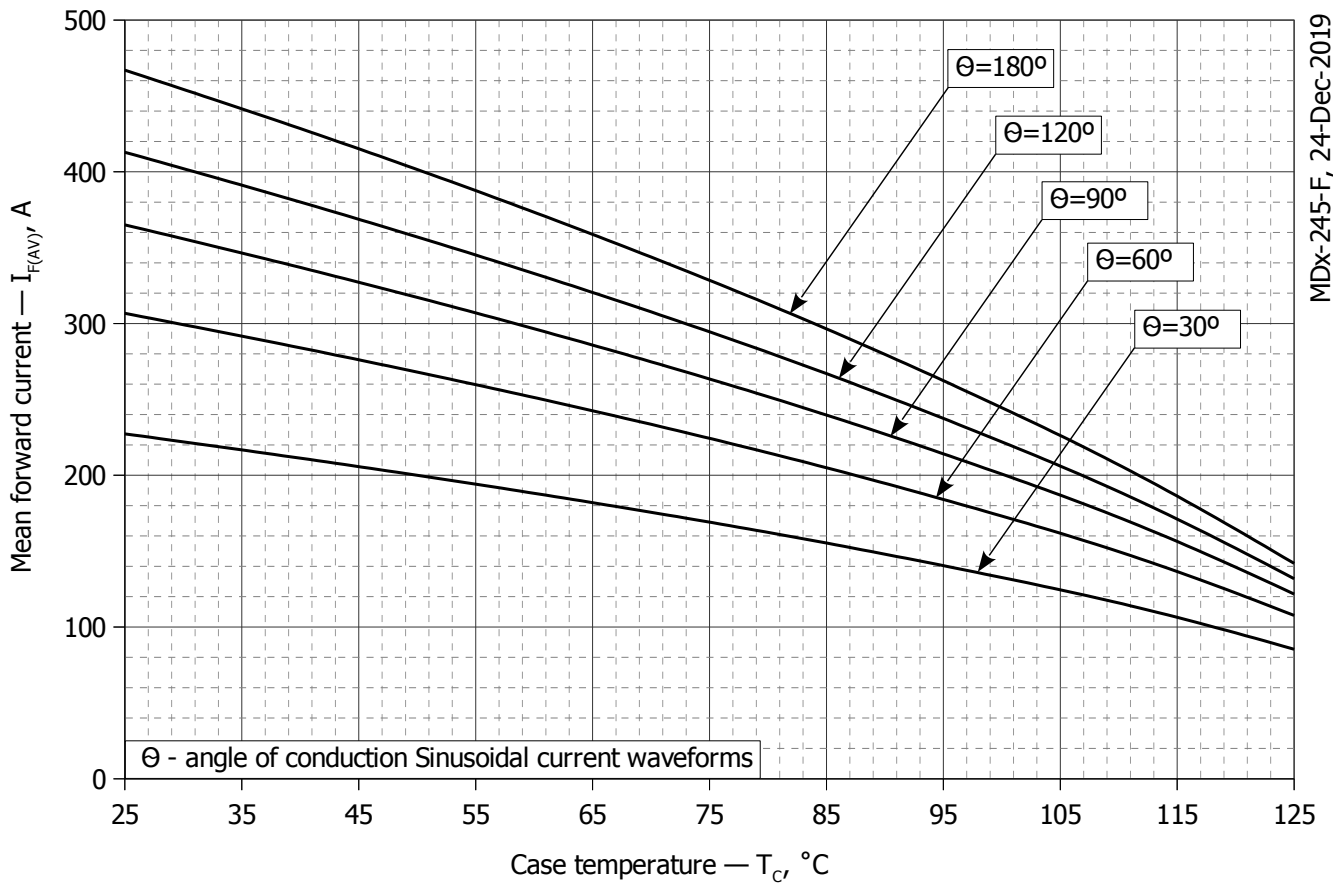


Fig 9 – Maximum case temperature DSC (sinusoidal current waveforms)

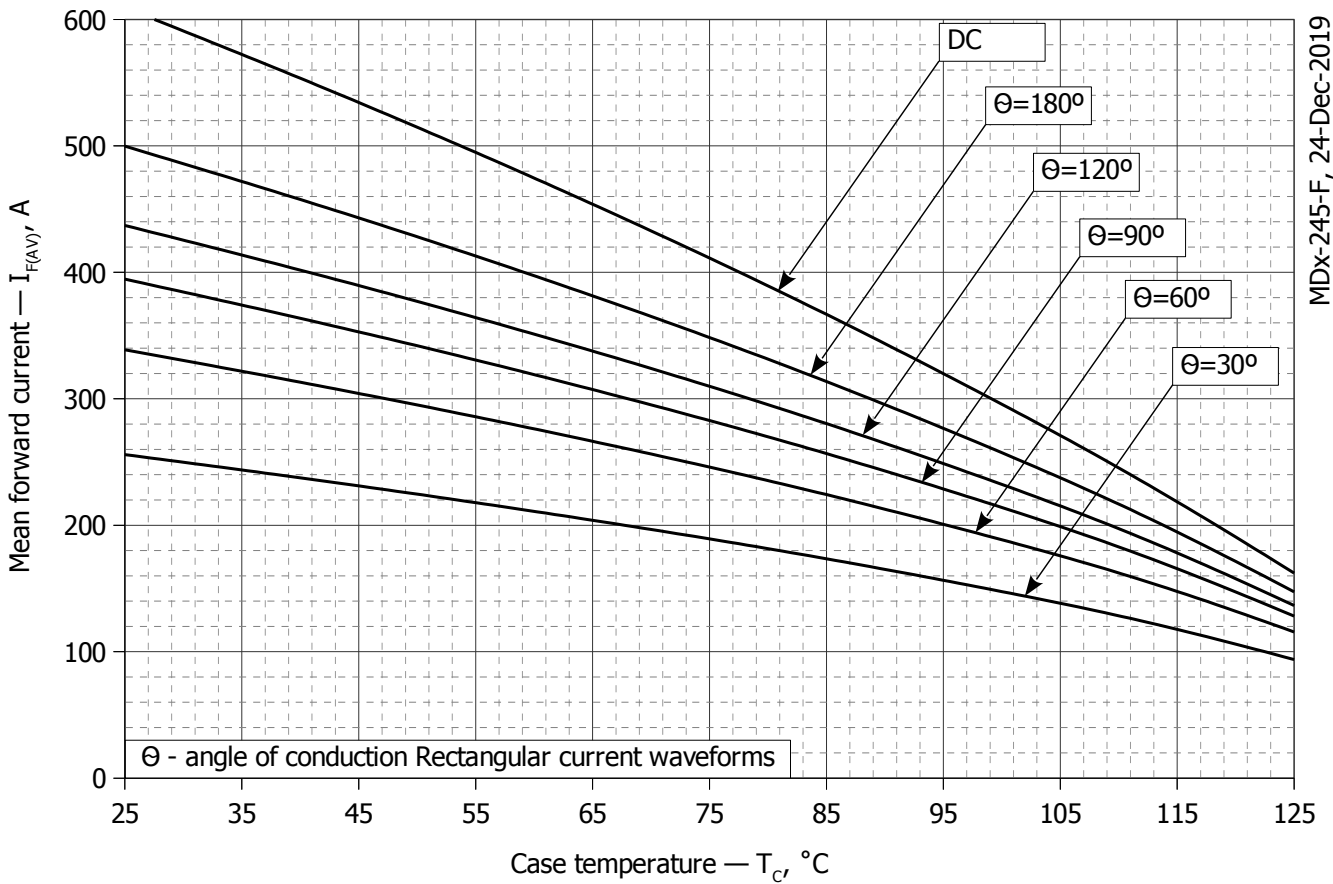


Fig 10 – Maximum case temperature DSC (rectangular current waveforms)

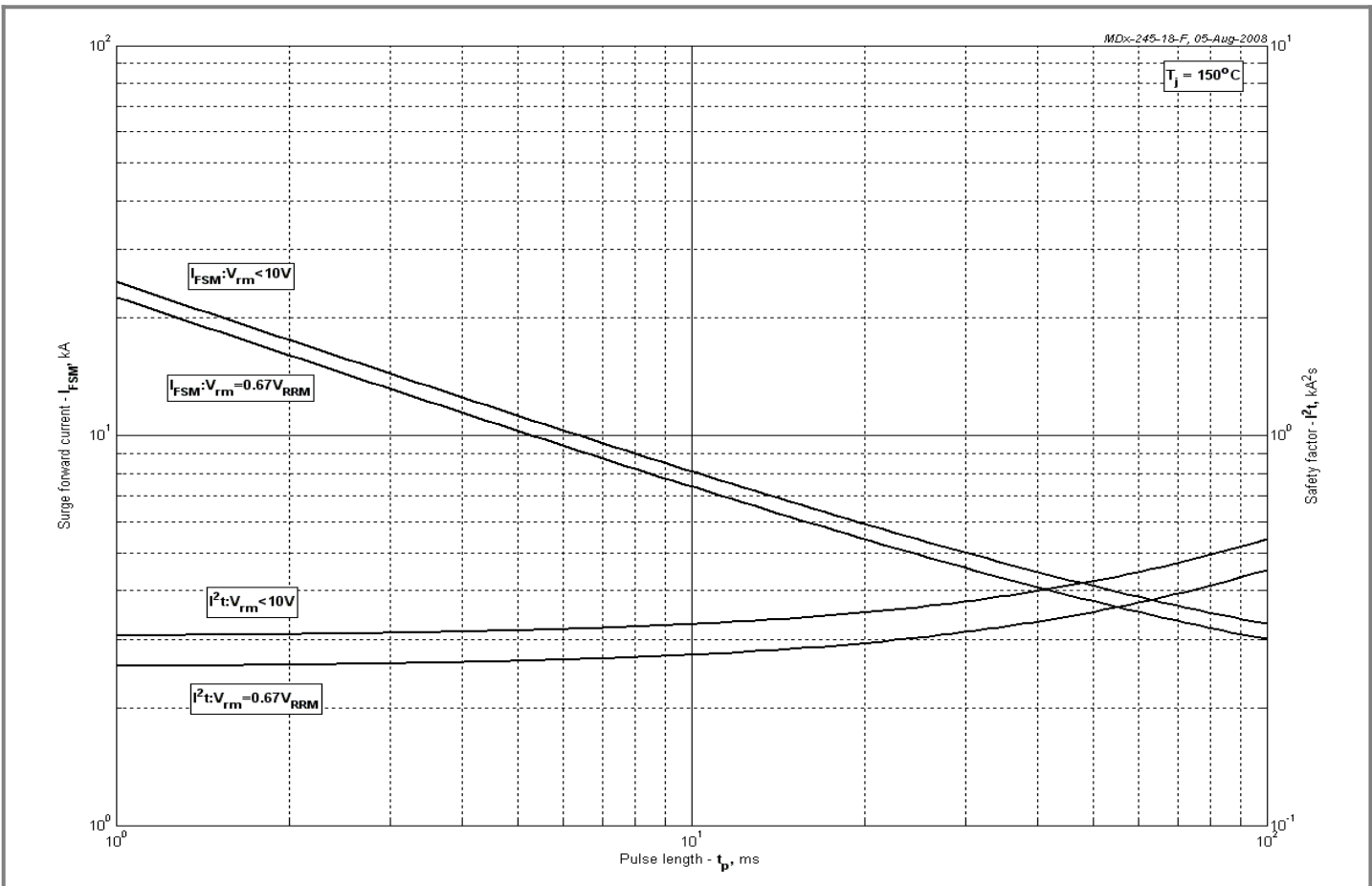


Fig 11 – Maximum surge and I^2t ratings

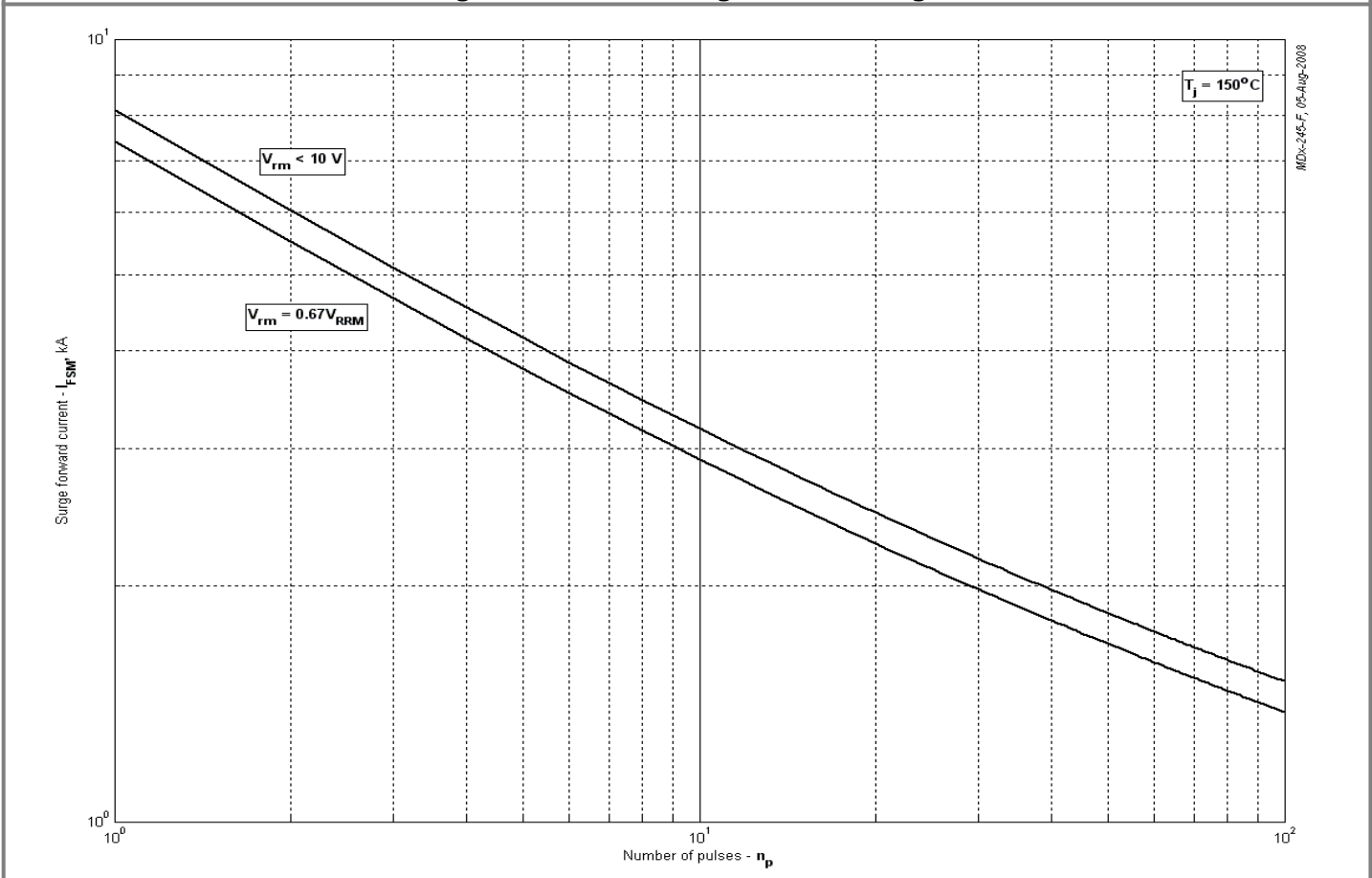


Fig 12 – Maximum surge ratings