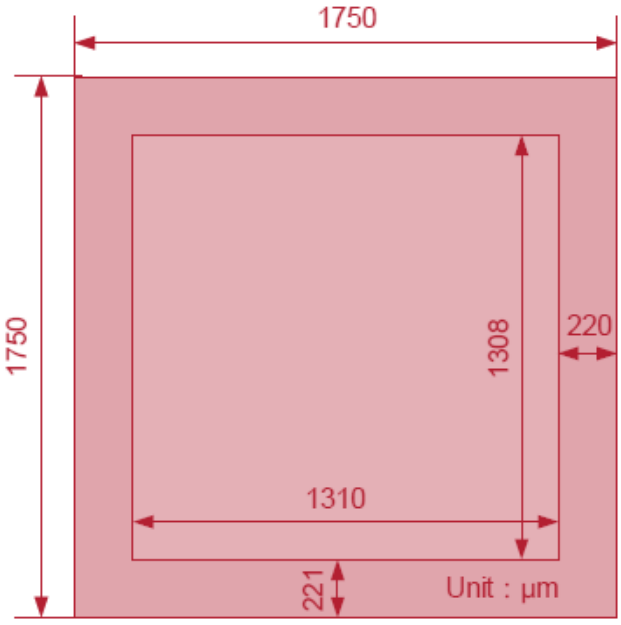
Features

- Zero Forward Recovery Voltage
- Zero Reverse Recovery Current
- Excellent Surge Current Capability
- Temperature Independent Switching
- Positive Temperature Coefficient on V_F
- High Frequency Operation

Part NO.		MSD010CS650B
V_{RRM}	=	650 V
$I_{F(AVG)}$	=	10 A
Q_C	=	33 nC

Wafer Parameters

Parameter	Typ.	Unit
Die Size	1750 x 1750	μm
Anode Pad Opening	1308 x 1310	μm
Wafer Diameter	150	mm
Thickness	150±10	μm
Anode Metalization (Al)	4	μm
Cathode Metalization (Ti/Ni/Ag)	0.1/0.5/1	μm
Grossdie	5166	



Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		650	V
$I_{F(AVG)}$	Average forward current	T_c=155°C	10*	A
I_{FSM}	Non-Repetitive forward surge current	T_c=25°C, t_p=10ms, Half Sine Wave	80	A
P_{tot}	Power dissipation	T_c=25°C T_c=110°C	125* 54*	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C

* Assumes thermal resistance of 1.2°C/W or less

Electrical Characteristics

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	650			V
V_F	Diode forward voltage	I_F=10A T_j=25°C IF=10A Tj=135°C I_F=10A T_j=175°C		1.28 1.37 1.45		V
I_R	Reverse current	V_R=650V T_j=25°C V_R=650V T_j=175°C		1 18		μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=400V T_j=25°C $Q_C = \int_0^{V_R} C(V)dV$		33		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600Vf=1MH z		443 53 47		pF
E_C	Capacitance stored energy	V_R=400V		4.8		μJ

Typical Performance

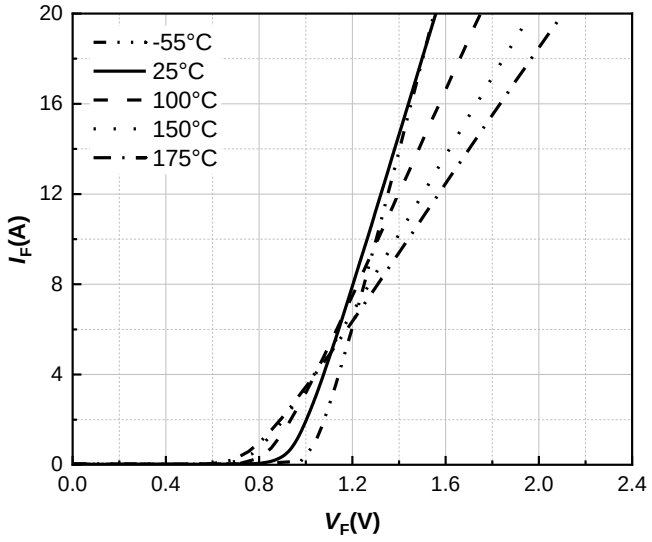


Figure 1. **Typical forward characteristics**

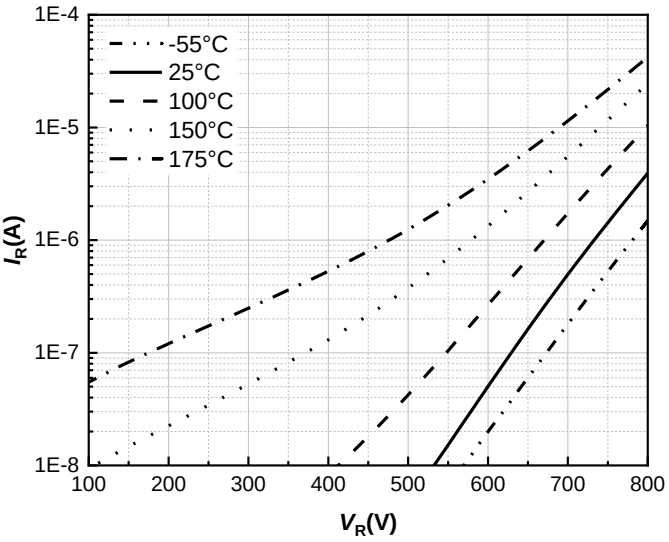


Figure 2. **Typical reverse current as function of reverse voltage**

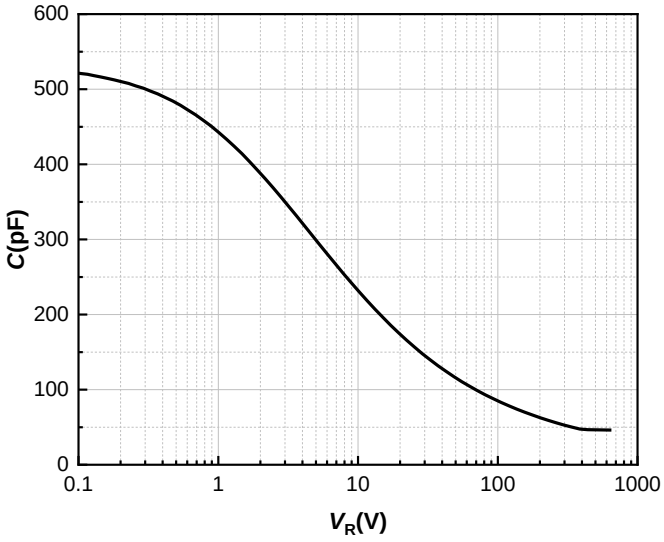


Figure 3**. Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz**

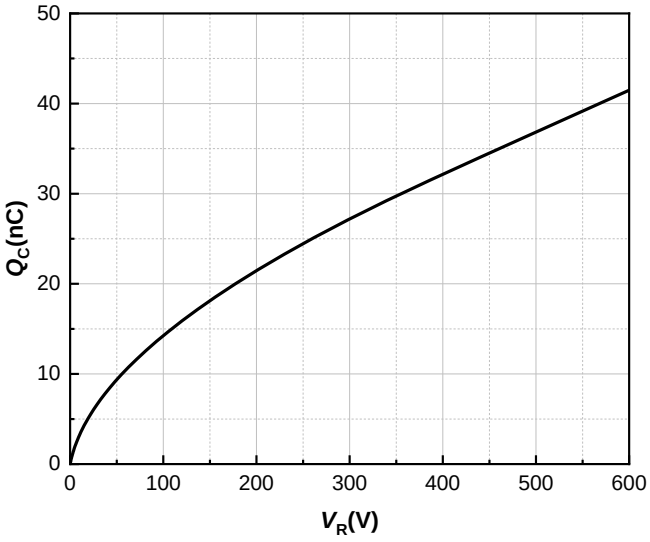


Figure 4**. Typical reverse charge as function of reverse voltage**