MMK35LB160HB

Half Controlled Single Phase Rectifier Bridge

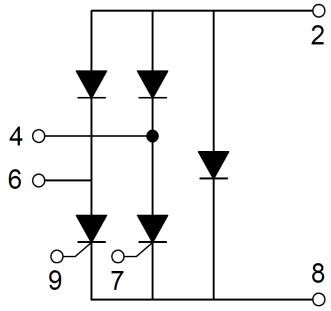
May 2015 **Version 01** **RoHS Compliant**

PRODUCT FEATURES

- Electrically Isolated by DBC Ceramic
- High Surge Current Capability
- Low Inductance Package

APPLICATIONS

- DC Motor Control and Drives
- Supply for DC power Equipment



MAXIMUM VOLTAGE RATINGS

T_C=25°C unless otherwise specified

Symbol	Parameter/Test Conditions	Values	Unit
		MMK35LB160HB	
V_{RRM}	Repetitive Peak Reverse Voltage	1600	V
V_{DRM}	Repetitive Peak Off State Voltage	1600	
V_{RSM}	Non-Repetitive Peak Reverse Voltage	1700	

ABSOLUTE MAXIMUM RATINGS (Thyristor)

Symbol	Parameter/Test Conditions		Values	Unit
$I_{T(AV)}$	Average On State Current	Single phase, half wave, 180°conduction, Tc= 95℃	35	A
$I_{T(RMS)}$	R.M.S. On State Current		55	
I_{TSM}	Non-Repetitive Surge On-State Current	1/2 cycle, 50/60HZ, peak value, Tc =45℃	450/500	
I^2t	For Fusing	1/2 cycle, 50/60HZ, peak value ,Tc =45℃	1012/1037	A^2S
T_J	Junction Temperature(Thyristor)		-40 to +125	℃

ABSOLUTE MAXIMUM RATINGS (Diode)

Symbol	Parameter/Test Conditions		Values	Unit
$I_{F(AV)}$	Average Forward Current	Single phase, half wave, 180°conduction, Tc= 105 ℃	35	A
$I_{F(RMS)}$	R.M.S. Forward Current		55	
I_{FSM}	Non-Repetitive Surge Forward Current	1/2 cycle, 50/60HZ, peak value, Tc =45℃	600/650	
I^2t	For Fusing	1/2 cycle, 50/60HZ, peak value ,Tc =45℃	1800/1753	A^2S
T_J	Junction Temperature(Diode)		-40 to +150	℃

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ELECTRICAL CHARACTERISTICS (Thyristor)

T_C=25°C unless otherwise specified

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{DRM}	Maximum Peak Off-State Current	$V_D = V_{DRM}$, T_J = 125℃			25	mA
I_{RRM}	Maximum Peak Reverse Current	$V_R = V_{RRM}$, T_J = 125℃			25	
V_{TM}	Maximum on-state voltage drop	I_{TM}=110A,td=10 ms, half sine			1.75	V
V_{TO}	For power-loss calculations only	T_J = 125℃			0.97	V
r_T					8.8	mΩ
V_{GT}	Max. required DC gate voltage to trigger	V_A=6V, R_A=1Ω,T_J = -40℃			4.0	V
		V_A=6V, R_A=1Ω		1.0	2.5	
		V_A=6V, R_A=1Ω,T_J = 125℃			1.7	
I_{GT}	Max. required DC gate current to trigger	V_A=6V, R_A=1Ω,T_J = -40℃			270	mA
		V_A=6V, R_A=1Ω		75	150	
		V_A=6V, R_A=1Ω,T_J = 125℃			80	
V_{GD}	Max. required DC gate voltage not to trigger,$V_D = V_{DRM}$, T_J = 125℃				0.25	V
I_{GD}	Max. required DC gate current not to trigger,$V_D = V_{DRM}$, T_J = 125℃				6	mA
I_H	Maximum holding current			100	200	mA
I_L	Maximum latching current			200	400	mA
P_{GM}	Maximum peak gate power				10	W
$P_{G(AV)}$	Maximum average gate power				2.5	
I_{GM}	Maximum peak gate current				2.5	A
$-V_{GM}$	Maximum peak negative gate voltage				10	V
dv/dt	Critical Rate of Rise of Off-State Voltage,T_J=125℃,exponential to 67% rated V_{DRM}				1000	V/μs
di/dt	Max.Rate of Rise of Turned-on Current, T_J =125℃,I_{TM}=110A, rated V_{DRM}				150	A/μs

ELECTRICAL CHARACTERISTICS (Diode)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{RM}	Maximum Reverse Leakage Current	$V_R = V_{RRM}$			0.5	mA
		$V_R = V_{RRM}$, T_J = 125℃			10	
V_F	Forward Voltage Drop	I_F=35A		1.02	1.25	V
V_{TO}	For power-loss calculations only , T_J = 125℃				0.88	V
r_T					8.5	mΩ

MODULE CHARACTERISTICS

T_C=25°C unless otherwise specified

T_J	Junction Temperature		-40 to +125	℃
T_{STG}	Storage Temperature Range		-40 to +125	℃
V_{ISO}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
Torque	to heatsink	Recommended（M5）	2.5～5	N.m
$R_{th(J-C)}$	Junction-to-Case Thermal Resistance(Per Thyristor/Per Diode)		0.6/1.0	K /W
Weight			85	g

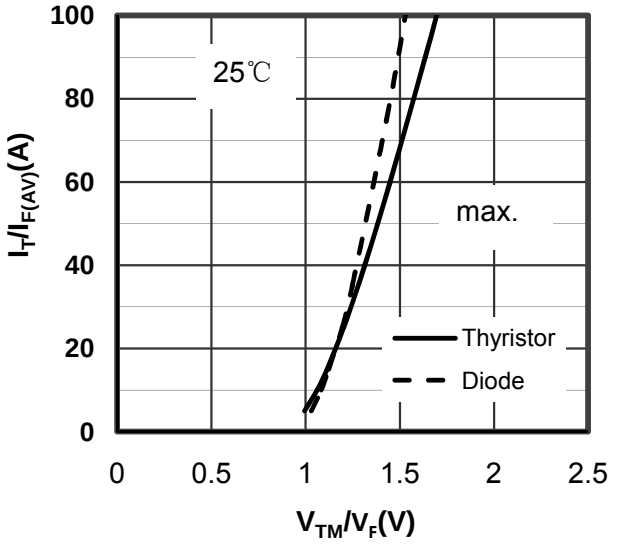


Figure1. Forward Voltage Drop vs Forward Current

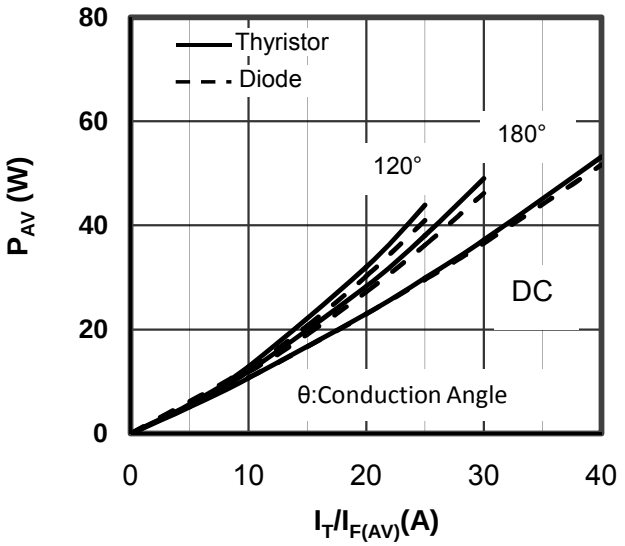


Figure2. Power dissipation vs. $I_T/I_{F(AV)}$

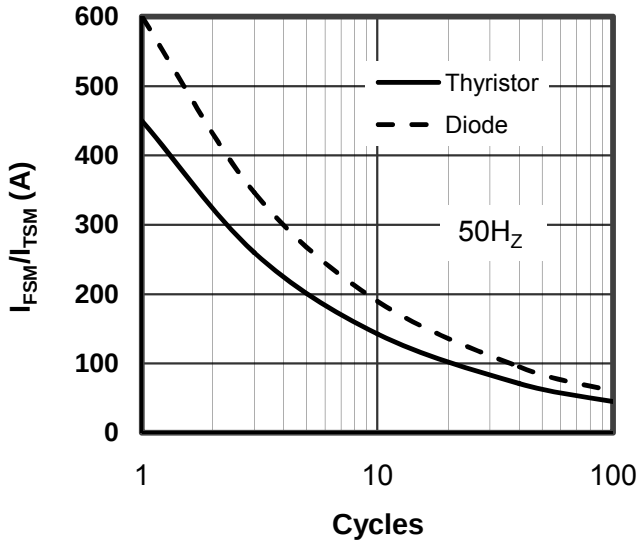


Figure3. Diode and SCR Max Non-Repetitive Surge

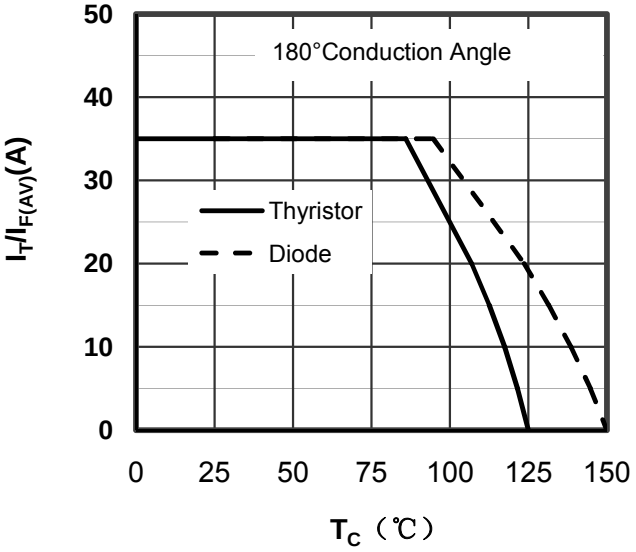


Figure4. Diode $I_{F(AV)}$ and SCR $I_{T(AV)}$vs.T_C

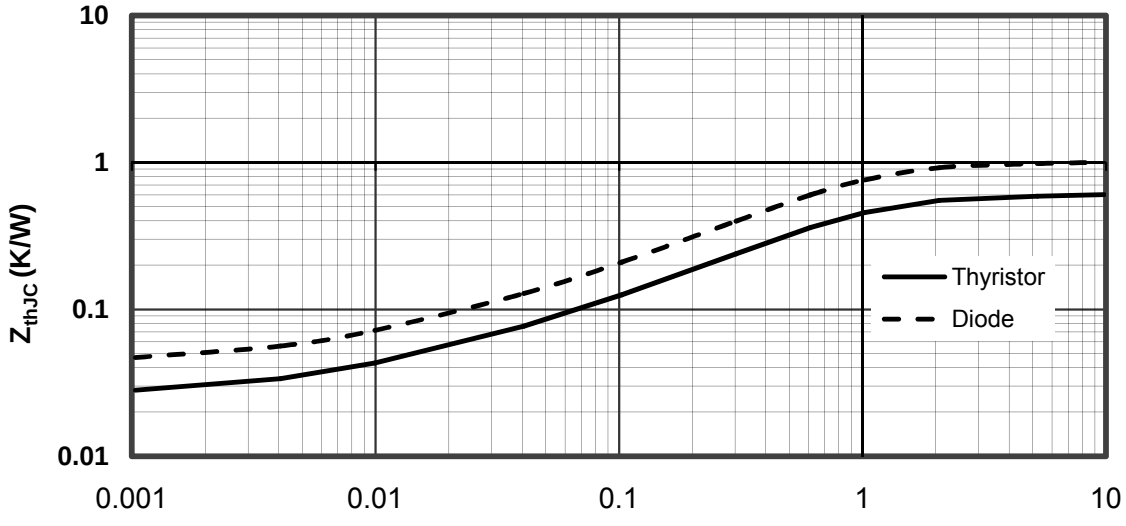


Figure5. Transient Thermal Impedance of Diode and SCR

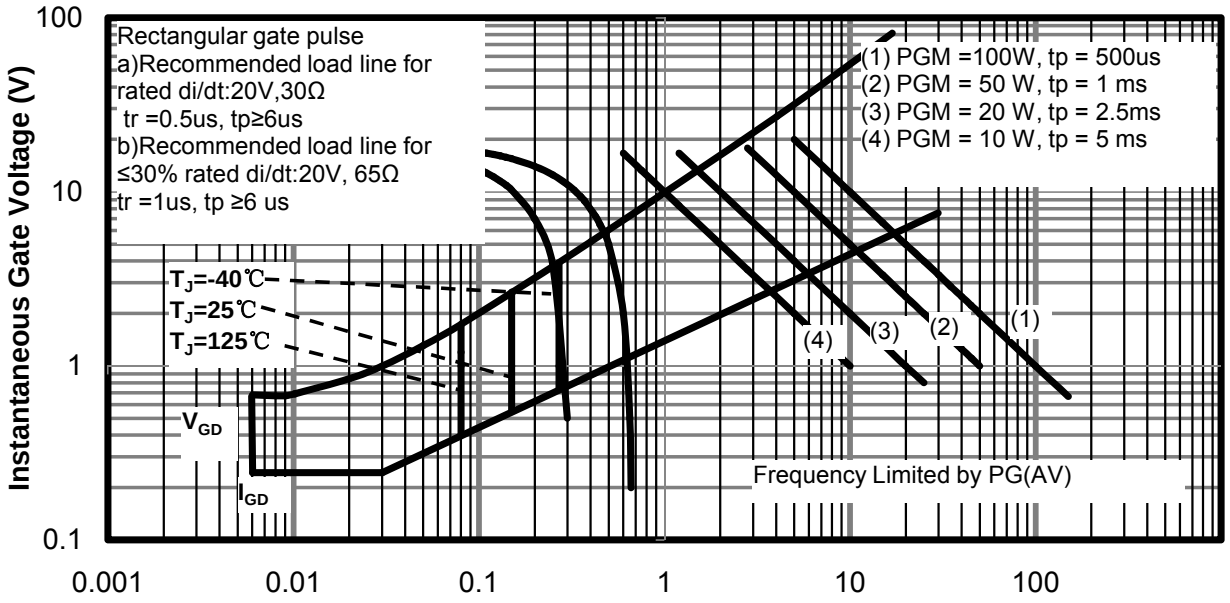
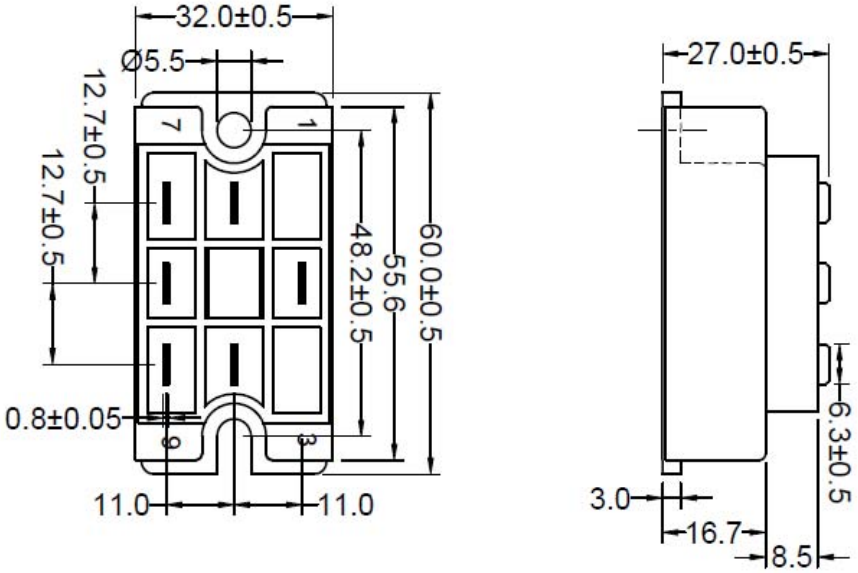


Figure 6. SCR Gate Characteristics



Dimensions in (mm)

Figure7. Package Outline