

# 1200V LARGE DIIPM Ver.6 Series APPLICATION NOTE

## PSS\*\*SA2FT

### Table of contents

CHAPTER 1 INTRODUCTION .....	2
1.1 Target Applications .....	2
1.2 Product Line-up .....	2
1.3 Functions and Features .....	2
1.4 The Differences of Previous Series (1200V Large DIIPM Ver.4) and This Series .....	3
CHAPTER 2 SPECIFICATIONS AND CHARACTERISTICS .....	4
2.1 Specifications .....	4
2.1.1 Maximum Ratings .....	4
2.1.2 Thermal Resistance .....	5
2.1.3 Electric Characteristics (Power Part) .....	5
2.1.4 Electric Characteristics (Control Part) .....	6
2.1.5 Recommended Operating Conditions .....	7
2.1.6 Mechanical Characteristics and Ratings .....	8
2.2 Protective Functions and Operating Sequence .....	9
2.2.1 Short Circuit Protection .....	9
2.2.2 Control Supply UV Protection .....	13
2.2.3 Temperature Output Function .....	15
2.3 Package Outlines .....	20
2.3.1 Outline Drawing .....	20
2.3.2 Power Chip Position .....	21
2.3.3 Marking Position .....	21
2.3.4 Terminal Description .....	22
2.4 Mounting Method .....	24
2.4.1 Electric Spacing .....	24
2.4.2 Mounting Method and Precautions .....	24
2.4.3 Soldering Conditions .....	25
CHAPTER 3 SYSTEM APPLICATION HIGHLIGHT .....	26
3.1 Application Guidance .....	26
3.1.1 System Connection .....	26
3.1.2 Interface Circuit (Direct Coupling Interface example) .....	27
3.1.3 Interface Circuit (Opto-coupler Isolated Interface) .....	28
3.1.4 Circuits of Signal Input terminals and Fo Terminal .....	29
3.1.5 Snubber Circuit .....	31
3.1.6 Influence of Wiring .....	32
3.1.7 Precaution for Wiring on PCB .....	33
3.1.8 SOA of DIIPM .....	34
3.1.9 SC SOA .....	35
3.1.10 Power Life Cycles .....	39
3.2 Power Loss and Thermal Dissipation Calculation .....	40
3.2.1 Power Loss Simulation .....	40
3.2.2 Temperature Rise Considerations and Calculation Example .....	42
3.3 Noise and ESD Withstand Capability .....	43
3.3.1 Evaluation Circuit of Noise Withstand Capability .....	43
3.3.2 Countermeasures and Precautions .....	43
3.3.3 Static Electricity Withstand Capability .....	44
CHAPTER 4 Bootstrap Circuit Operation .....	46
4.1 Bootstrap Circuit Operation .....	46
4.2 Bootstrap Supply Circuit Current at Switching State .....	46
4.3 Note for designing the bootstrap circuit .....	49
4.4 Initial charging in bootstrap circuit .....	50
CHAPTER 5 PACKAGE HANDLING .....	51
5.1 Packaging Specification .....	51
5.2 Handling Precautions .....	52