LUR150G1203BO
LUR150G1203BU

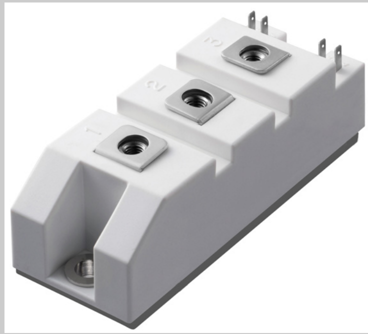
SUSPM™

1200V 150A Chopper IGBT Module

Features

Target data

- Trench & Field Stop technology (IGBT3)
  - Low saturation voltage
  - Low turn-off Losses
  - Short tail current
  - Positive temperature coefficient
  - Easy paralleling
- Free wheeling diodes with fast and soft reverse recovery
- Industrial standard package with copper base plate



SUSPM1

94.5 x 34.5 x 31.1 mm

Applications

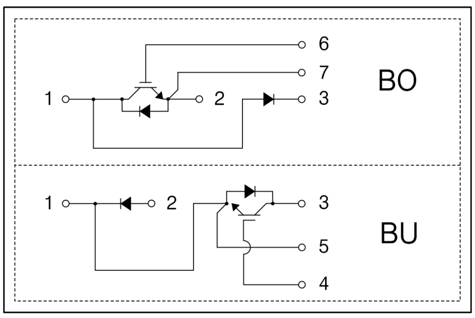
- Boost, Buck (Power Supply)
- Brake unit / UPS
- Battery charger

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Item	Symbol	Conditions	Value	Units
IGBT	V_{CES}		1200	V
	V_{GES}		± 20	V
	I_C	@T_j = 150 °C, T_C = 25 °C, Continuous	-	A
		@T_j = 150 °C, T_C = 80 °C, Continuous	150	A
	I_{CM}	@T_C = 80 °C, t_P = 1ms	300	A
	T_{SC}	Chip Level, @T_j = 150 °C, V_{GE} = 15 V, V_{CES} < 600 V	-	μs
	T_j	Operating Junction Temperature *(1)	-40~125	°C
	P_D	@T_j = 150°C, T_C = 25 °C	750	W
		@T_j = 150 °C, T_C = 80 °C	400	W
Inverse Diode	V_{RRM}		1200	V
	I_F		150	A
	I_{FRM}	t_P = 1 ms	300	A
	T_j	Operating Junction Temperature *(1)	-40~125	°C
Freewheeling Diode	V_{RRM}		1200	V
	I_F		150	A
	I_{FRM}	t_P = 1 ms	300	A
	T_j	Operating Junction Temperature *(1)	-40~125	°C
Module	T_{stg}	Storage Junction Temperature	-40~125	°C
	V_{iso}	@ AC 1 minute	2500	V
	M_t	Main Terminal Mounting torque (M6)	2.5~5.0	Nm
	M_S	Heat sink Mounting torque (M6)	3.0~6.0	Nm
	W	Weight	180	g

Internal Circuit & Pin Description

Pin Number	Pin Name	Pin Description
1	C2E1	Out
2	E2	Negative DC Link Output
3	C1	Positive DC Link Output
4	G1	Gate Input for High-side
5	E1	Emitter Input for High-side
6	G2	Gate Input for Low-side
7	E2	Emitter Input for Low-side



(Note *1) The Maximum junction temperature of chip is 150 °C.

Electrical Characteristics of IGBT and Diodes T_C = 25°C unless otherwise noted

Static Characteristics of IGBT

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{CES}	C-E Breakdown Voltage	V_{GE} = 0 V, I_C = 1 mA	1200	-	-	V
I_{CES}	C-E Cut-Off Current	V_{CE} = V_{CES}, V_{GE} = 0 V	-	-	1	mA
I_{GES}	G-E Leakage Current	V_{GE} = V_{GES}, V_{CE} = 0 V	-	-	-	nA
$V_{GE(th)}$	G-E Threshold Voltage	V_{GE} = V_{CE}, I_C = 150 mA	-	6.0	-	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	I_C = 150 A, V_{GE} = 15 V, T_C = 25 °C	-	1.9	-	V
		I_C = 150 A, V_{GE} = 15 V, T_C = 125 °C	-	2.2	-	V

Dynamic Characteristics of IGBT

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C_{ies}	Input Capacitance	V_{CE} = 25 V, V_{GE} = 0 V f = 1 MHz, T_C = 25 °C	-	10.8	-	nF
C_{oes}	Output Capacitance		-	0.6	-	nF
C_{res}	Reverse Transfer Capacitance		-	0.5	-	nF
t_d(on)	Turn-On Delay Time	T_C = 125 °C, R_G = 1.8 Ω L = 25 μH, V_{DC} = 600 V V_{GE} = 15 V ~ -15 V I_C = 150 A	-	-	-	ns
t_r	Rise Time		-	-	-	ns
t_d(off)	Turn-Off Delay Time		-	-	-	ns
t_f	Fall Time		-	-	-	ns
E_{on}	Turn-On Switching Loss		-	-	-	mJ
E_{off}	Turn-Off Switching Loss		-	-	-	mJ
E_{ts}	Total Switching Loss		-	-	-	mJ
Q_g	Total Gate Charge	V_{GE} = 0 V ~ +15 V	-	1.95	-	μC
Q_{ge}	Gate-Emitter Charge		-	0.24	-	μC
Q_{gc}	Gate-Collector Charge		-	1.11	-	μC

Electrical Characteristics of Inverse Diode

Symbol	Parameter	Test Conditions		Min	Typ	Max	Units
V_F	Diode Forward Voltage	I_F = 150 A	T_C = 125 °C	-	2.0	-	V
t_{rr}	Diode Reverse Recovery Time	R_G = 1.8 Ω L = 25 μH V_{DC} = 600 V V_{GE} = 15 V ~ -15 V I_C = 150 A	T_C = 125 °C	-	-	-	
I_{RRM}	Diode Peak Reverse Recovery Current		T_C = 125 °C	-	-	-	
Q_{rr}	Diode Reverse Recovery Charge		T_C = 125 °C	-	-	-	
E_{rr}	Diode Reverse Recovery Energy		T_C = 125 °C	-	-	-	

Electrical Characteristics of Freewheeling Diode

Symbol	Parameter	Test Conditions		Min	Typ	Max	Units
V_F	Diode Forward Voltage	I_F = 150 A	T_C = 125 °C	-	1.8	-	V
t_{rr}	Diode Reverse Recovery Time	R_G = 1.8 Ω L = 25 μH V_{DC} = 600 V V_{GE} = 15 V ~ -15 V I_F = 150 A	T_C = 125 °C	-	-	-	
I_{RRM}	Diode Peak Reverse Recovery Current		T_C = 125 °C	-	-	-	
Q_{rr}	Diode Reverse Recovery Charge		T_C = 125 °C	-	-	-	
E_{rr}	Diode Reverse Recovery Energy		T_C = 125 °C	-	-	-	

Thermal Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$R_{th(J-C)}$	Thermal Resistance (IGBT)	Junction-to-Case	-	0.16	-	°C/W
$R_{th(J-C)}$	Thermal Resistance (Inverse Diode)	Junction-to-Case	-	0.44	-	°C/W
$R_{th(J-C)}$	Thermal Resistance (FRD Diode)	Junction-to-Case	-	0.3	-	°C/W

* This specifications may not be considered as an assurance of characteristics and may not have same characteristics in case of using different test systems from @ LSIS. We therefore strongly recommend prior consultation of our engineers.

Package Dimension (Dimension in mm)