

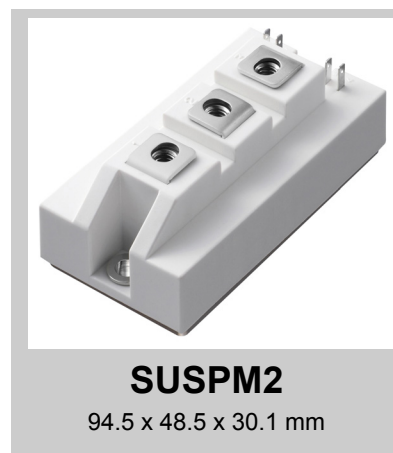
Features

- Trench & Field Stop technology
 - Low saturation voltage
 - Low turn-off losses
 - Short tail current
 - Positive temperature coefficient
 - High ruggedness
- Free wheeling diodes with fast and soft reverse recovery
- Industrial standard package with copper base plate
- High thermal performance (AlN substrate is used)
- Included ESD protection function ^{*(1)}

Applications

- Welder / Power supply
- UPS / Inverter
- Industrial motor drive

Target data

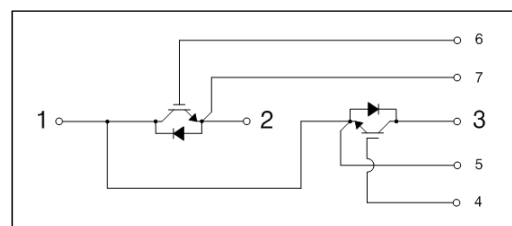


Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

Item	Symbol	Conditions	Value	Units
IGBT	V_{CES}		1700	V
	V_{GES}		± 20	V
	I_C	@ $T_j = 150^\circ\text{C}$, $T_C = 25^\circ\text{C}$, Continuous	250	A
		@ $T_j = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$, Continuous	150	A
	I_{CM}	@ $T_C = 80^\circ\text{C}$, $t_p = 1\text{ms}$	200	A
	T_{SC}	Chip Level, @ $T_j = 150^\circ\text{C}$, $V_{GE} = 15\text{V}$, $V_{CES} < 1700\text{V}$	-	μs
	T_j	Operating Junction Temperature ^{*(2)}	-40~125	$^\circ\text{C}$
Diode	P_D	@ $T_j = 150^\circ\text{C}$, $T_C = 25^\circ\text{C}$	1000	W
		@ $T_j = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	500	W
	V_{RRM}		1700	V
	I_F		100	A
Module	I_{FRM}	$t_p = 1\text{ms}$	200	A
	T_j	Operating Junction Temperature ^{*(2)}	-40~125	$^\circ\text{C}$
	T_{stg}	Storage Junction Temperature	-40~125	$^\circ\text{C}$
Module	V_{iso}	@ AC 1 minute	2500	V
	M_t	Main Terminal Mounting Torque (M6)	2.5~6.0	Nm
	M_S	Heat sink Mounting Torque (M6)	3.0~6.0	Nm
	W	Weight	260	g

Internal Circuit & Pin Description

Pin Number	Pin Name	Pin Description
1	C2E1	Output
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) Option : Included $\pm 28\text{V}$ Zener Diode between Gate and Emitter.

(Note *2) The Maximum junction temperature of chip is 150°C .

Electrical Characteristics of IGBT $T_C = 25^\circ\text{C}$ unless otherwise noted

Static Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{CES}	C-E Breakdown Voltage	$V_{GE} = 0\text{ V}, I_C = 1\text{ mA}$	1700	-	-	V
I_{CES}	C-E Cut-Off Current	$V_{CE} = V_{CES}, V_{GE} = 0\text{ V}$	-	-	1	mA
I_{GES}	G-E Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0\text{ V}$	-	-	-	nA
$V_{GE(th)}$	G-E Threshold Voltage	$V_{GE} = V_{CE}, I_C = 100\text{ mA}$	-	6.3	-	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C = 100\text{ A}, V_{GE} = 15\text{ V}, T_C = 25^\circ\text{C}$	-	2.2	-	V
		$I_C = 100\text{ A}, V_{GE} = 15\text{ V}, T_C = 125^\circ\text{C}$	-	2.6	-	V

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C_{ies}	Input Capacitance	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$ $f = 1\text{ MHz}, T_C = 25^\circ\text{C}$	-	8.8	-	nF
C_{oes}	Output Capacitance		-	0.4	-	nF
C_{res}	Reverse Transfer Capacitance		-	0.3	-	nF
$t_d(on)$	Turn-On Delay Time	$T_C = 125^\circ\text{C}, R_G = 8.2\ \Omega$ $L = 100\ \mu\text{H}, V_{DC} = 900\text{ V}$ $V_{GE} = 15\text{ V} \sim -15\text{ V}$ $I_C = 100\text{ A}$	-	-	-	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	$V_{GE} = 0\text{ V} \sim +15\text{ V}$	-	-	-	μC
Q_{ge}	Gate-Emitter Charge		-	-	-	μC
Q_{gc}	Gate-Collector Charge		-	-	-	μC

Electrical Characteristics of Diode

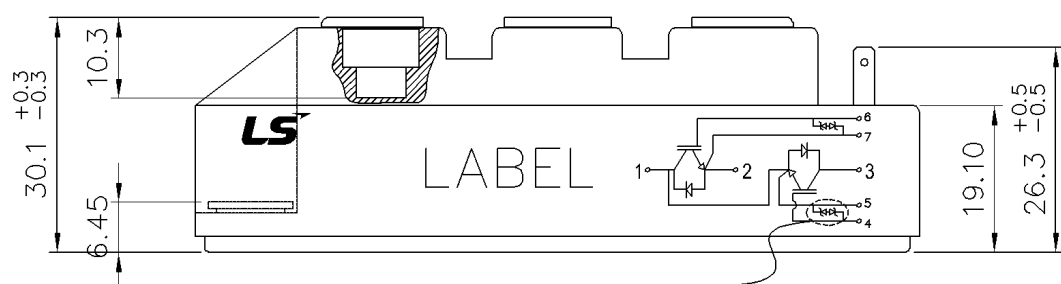
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_F	Diode Forward Voltage	$I_F = 100\text{ A}$ $V_{GE} = 0\text{ V}$ $T_C = 25^\circ\text{C}$	-	2	-	V
		$T_C = 125^\circ\text{C}$	-	2.1	-	
t_{rr}	Diode Reverse Recovery Time	$T_C = 25^\circ\text{C}$	-	-	-	ns
		$T_C = 125^\circ\text{C}$	-	-	-	
I_{RRM}	Diode Peak Reverse Recovery Current	$R_G = 8.2\ \Omega$ $L = 100\ \mu\text{H}$ $V_{DC} = 900\text{ V}$ $V_{GE} = 15\text{ V} \sim -15\text{ V}$ $I_C = 100\text{ A}$ $T_C = 25^\circ\text{C}$	-	-	-	A
		$T_C = 125^\circ\text{C}$	-	-	-	
Q_{rr}	Diode Reverse Recovery Charge	$T_C = 25^\circ\text{C}$	-	-	-	μC
		$T_C = 125^\circ\text{C}$	-	-	-	
E_{rr}	Diode Reverse Recovery Energy	$T_C = 25^\circ\text{C}$	-	-	-	mJ
		$T_C = 125^\circ\text{C}$	-	-	-	

Thermal Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$R_{th(J-C)}$	Thermal Resistance (IGBT Part)	Junction-to-Case	-	0.12	-	$^\circ\text{C/W}$
$R_{th(J-C)D}$	Thermal Resistance (Diode Part)	Junction-to-Case	-	0.25	-	$^\circ\text{C/W}$
$R_{th(C-H)}$	Thermal Resistance (IGBT Part)	Case-to-Heatsink	-	0.05	-	$^\circ\text{C/W}$
$R_{th(C-H)D}$	Thermal Resistance (Diode Part)	Case-to-Heatsink	-	0.1	-	$^\circ\text{C/W}$

* 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)



*Zener Diode for ESD Protection.