SEMICONDUCTOR

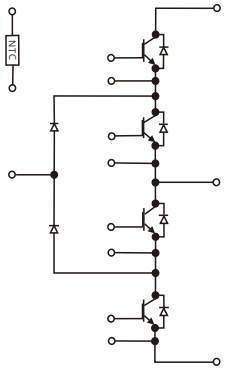
JF3L100R07W2HT6
3-Level IGBT Module

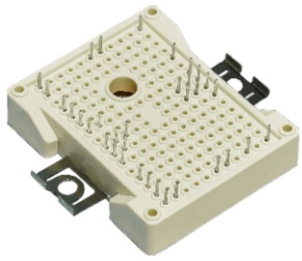
Features

- Trench+ Field Stop Technology
- Low Switching Losses
- Positive Temperature Coefficient
- Maximum Junction Temperature 175℃

Product Summary		
V_{CES}(V)	V_{CESAT}(V)Typ	I_C(A)
650	1.45 @ 15V,100A	100

Block Diagram





Application

- 3-Level IGBT
- UPS
- PFC
- PV Inverter

IGBT,Inverter

Table1 Absolute Maximum Ratings (T_C=25℃, unless otherwise specified)

Parameters	Symbol	Value	Unit
Collector-Emmiter Voltage	V_{CES}	650	V
Gate-Emmiter Voltage	V_{GES}	±20	V
Collector DC Current-continuous T_C=100°C, T_J max=175℃	I_C	100	A
Repetitive peak collector current tp=1ms	I_{CRM}	200	A
Total power dissipation	P_D	450	W

Table 2. Electrical Chatacteristics (T_J=25℃, unless otherwise specified)

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emmiter saturation Voltage	V_{CESAT}	V_{GE}=15V,I_C=100A,T_j=25°C		1.45	1.9	V
		V_{GE}=15V,I_C=100A,T_j=125°C		1.6		
		V_{GE}=15V,I_C=100A,T_j=150°C		1.7		
Gate Threshold Voltage	$V_{GE(TH)}$	V_{CE}=V_{GE},I_C=1.6mA	5.1	5.8	6.5	V
Internal gate resistor	R_{gint}	T_j=25°C		2.0		Ω
Gate charge	Q_G	V_{GE}=-15V~+15V		0.69		μC
Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=650V,V_{GE}=0V			1	mA
Gate-body Leakage Current	I_{GES}	V_{CE}=0V,V_{GE}=20V			400	nA

Input Capacitance	C_{IES}	V_{CE}=25V,V_{GE}=0V,f=1MHz		11.6		nF
Reverse Transfer Capacitance	C_{RES}			0.23		nF
Turn-On Delay Time	td(on)	V_{CE}=300V,I_C=100A, V_{GE}=±15V,R_G=3.3Ω, T_j=25°C		42		ns
Turn-On Rise Time	tr			22		ns
Turn-Off Delay Time	td(off)			194		ns
Turn-Off Fall Time	tf			42		ns
Turn-On energy	E_{on}			0.46		mJ
Turn-Off energy	E_{off}			2.2		mJ
Turn-On Delay Time	td(on)	V_{CE}=300V,I_C=100A, V_{GE}=±15V,R_G=3.3Ω, T_j=125°C		50		ns
Turn-On Rise Time	tr			26		ns
Turn-Off Delay Time	td(off)			210		ns
Turn-Off Fall Time	tf			54		ns
Turn-On energy	E_{on}			0.7		mJ
Turn-Off energy	E_{off}			2.7		mJ
Turn-On Delay Time	td(on)	V_{CE}=300V,I_C=100A, V_{GE}=±15V,R_G=3.3Ω, T_j=150°C		54		ns
Turn-On Rise Time	tr			26		ns
Turn-Off Delay Time	td(off)			218		ns
Turn-Off Fall Time	tf			62		ns
Turn-On energy	E_{on}			0.8		mJ
Turn-Off energy	E_{off}			3.0		mJ
SC data	I_{SC}	tp≤6us, V_{GE}=15V, Vcc=360V, V_{CEM}≤650V, T_j=125°C		500		A
Thermal resistance,junction to case	R_{thJC}	per IGBT		0.302	0.332	K/W

Diode, Inverter

Table1 Absolute Maximum Ratings (T_C=25℃, unless otherwise specified)

Parameters	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	650	V
Continuous DC forward current	I_F	100	A
Repetitive peak forward current tp=1ms	I_{FRM}	200	A

Table 2. Electrical Chatacteristics (T_J=25℃, unless otherwise specified)

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_F	I_F=100A,T_j=25°C		1.57	2.2	V
		I_F=100A,T_j=125°C		1.52		
		I_F=100A,T_j=150°C		1.47		
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=25°C		100		A
Reverse Recovery Charge	Qrr			4.8		μC
Reverse recovery energy	Erec			1.34		mJ
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=125°C		123		A
Reverse Recovery Charge	Qrr			8.8		μC
Reverse recovery energy	Erec			2.4		mJ
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=150°C		129		A
Reverse Recovery Charge	Qrr			10		μC
Reverse recovery energy	Erec			2.66		mJ
Thermal resistance,junction to case	R_{thJC}	per diode		0.538	0.592	K/W

Diode,D5-D6

Table1 Absolute Maximum Ratings (T_C=25℃, unless otherwise specified)

Parameters	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	650	V
Continuous DC forward current	I_F	100	A
Repetitive peak forward current tp=1ms	I_{FRM}	200	A

Table 2. Electrical Chatacteristics (T_J=25℃, unless otherwise specified)

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_F	I_F=100A,T_j=25°C		1.65	2.05	V
		I_F=100A,T_j=125°C		1.60		
		I_F=100A,T_j=150°C		1.50		
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=25°C		97		A
Reverse Recovery Charge	Qrr			4.7		μC
Reverse recovery energy	Erec			1.3		mJ
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=125°C		120		A
Reverse Recovery Charge	Qrr			8.5		μC
Reverse recovery energy	Erec			2.39		mJ
Diode Peak Reverse Recovery Current	Irrm	I_F=100A V_R=300V -diF/dt =3520A/μs V_{GE}=-15V,T_j=150°C		128		A
Reverse Recovery Charge	Qrr			9.9		μC
Reverse recovery energy	Erec			2.65		mJ
Thermal resistance,junction to case	R_{thJC}	per diode		0.425	0.468	K/W

NTC-Thermistor

Table 1. Electrical Chatacteristics (T_J=25℃, unless otherwise specified)

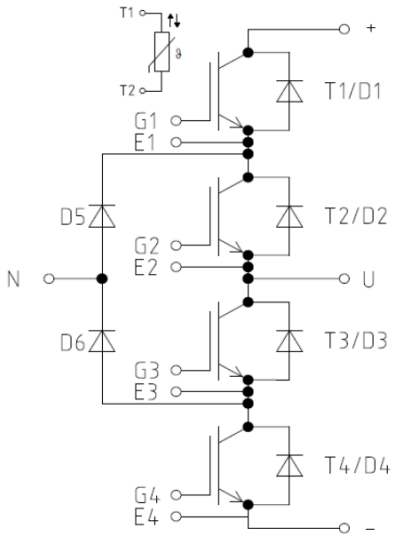
Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Rated resistances	R_{25}	T_C=25℃, ±5%		5		KΩ
B-value	$R_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K
	$R_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$		3411		K
	$R_{25/100}$	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15K))]$		3433		K
Deviation of R100	$\Delta R/R$	Tc=100℃, R_{100}=493.3Ω	-5		5	%
Power dissipation	P_{25}				20	mW

Module

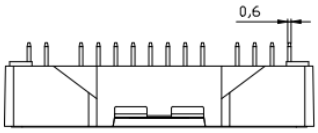
Table 1. Electrical Chatacteristics (T_J=25℃, unless otherwise specified)

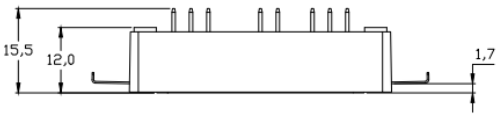
Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=60s		2500		V
Maximum junction temperature	T_{jmax}				175	℃
Storage temperature	T_{stg}		-40		125	℃
Mounting torque for modul mounting	M		3.0		6.0	Nm
Weight	W			39		g

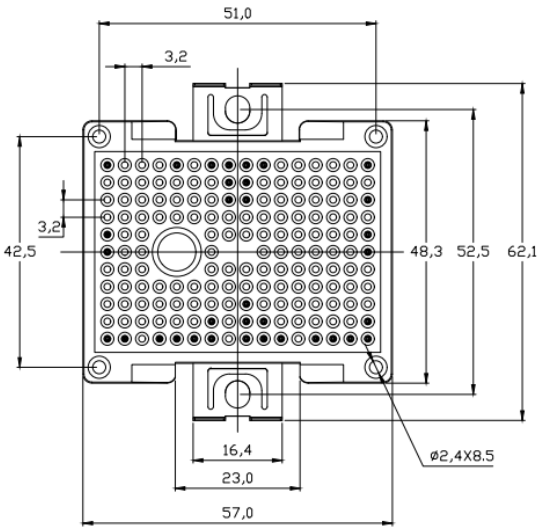
Circuit diagram

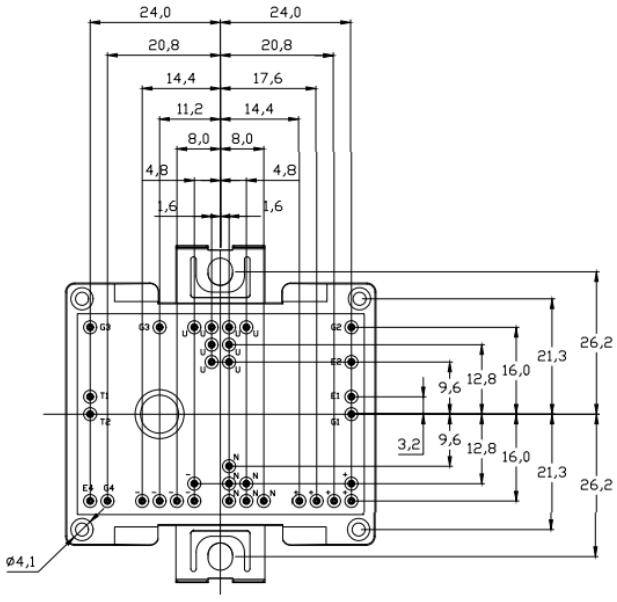


Package outlines









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