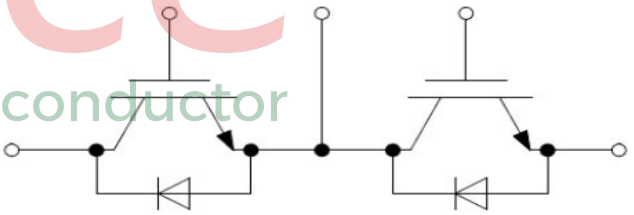
IGBT - Field Stop, Trench, Soft Fast Recovery Diode

1700V/300A

Features

- Electrical features
  - V_{CES}=1700V
  - $I_{C\,nom}$=300A / I_{CRM}=600A
  - Low switching losses
  - Low inductance
  - Fast switching and short tail current
  - High power and thermal cycling capability
- Mechanical features
  - High power and thermal cycling capability
  - Al2O3 substrate with low thermal resistance
  - Copper base plate
- Potential Applications
  - Switching mode power supply
  - Drive inverters with brake system
  - Uninterruptible power supply
  - AC and DC servo drive amplifier



Half Bridge

Device	Package	Shipping
SPM300V170Y62HS	Y62	Tray

IGBT, Inverter

Maximum Rated Values

Parameter	Note or test condition	Symbol	Values	Unit
Collector-emitter voltage	Tvj = 25°C	VCES	1700	V
Continuous DC collector current	TC = 100°C, Tvj, max = 150°C	IC nom	300	A
Repetitive peak collector current	tP = 1 ms	ICRM	600	A
Total power dissipation	TC = 25°C, Tvj, max = 175 °C	Ptot	1600	W
Gate-emitter peak voltage		VGES	+/-20	V

Characteristic Value

Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	V_{CE},sat	1.7	1.9 2.2 2.3	2.1	V V V
Gate threshold voltage	I_C = 2mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.1	5.6	6.1	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.55		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		6.0		Ω
Collector-emitter cut-off current	VCE = 1700 V, VGE = 0 V, Tvj = 25°C		I_{CES}			2	mA
Gate-emitter leakage current	VCE = 0 V, VGE = 20 V, Tvj = 25°C		I_{GES}			200	nA
Thermal resistance, junction to case	Per IGBT		R_{thJC}			0.12	K/W

Diode, Inverter

Maximum Rated Values

Parameter	Note or test condition	Symbol	Values	Unit
Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1700	V
Continuous DC forward current		I_F	300	A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	600	A

Characteristic Value

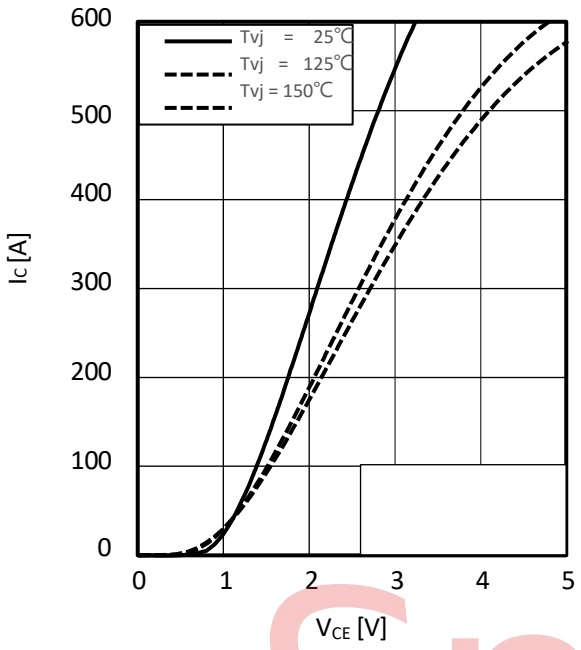
Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F = 300 A, V_{GE} = 0V	T_{vj} = 25°C	V_F		2.00		V
		T_{vj} = 125°C			1.75		V
		T_{vj} = 150°C			1.70		V

Module

Characteristic Value

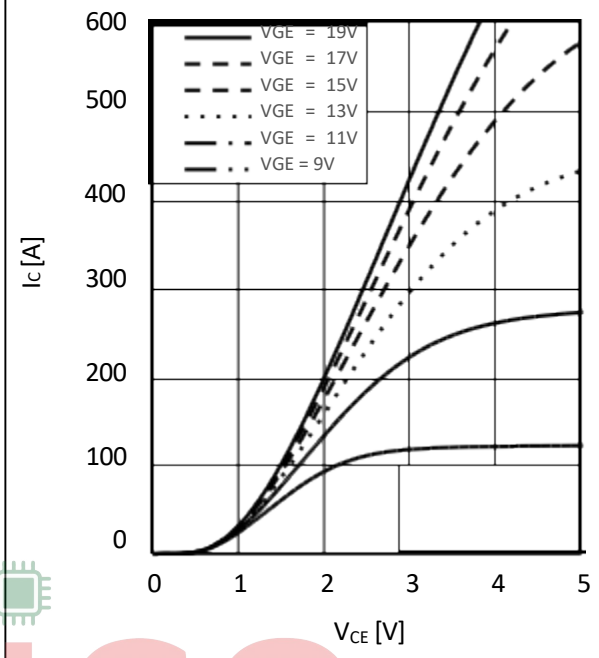
Parameter	Note or test condition	Symbol	Values			Unit
			Min.	Typ.	Max.	
Isolation Voltage	RMS, f=50HZ,1min	V_{ISOL}			3400	V
Stray inductance module		L_{sCE}		20		nH
Operation Junction Temperature		T_{jop}	-40		150	C
Storage Temperature Range		T_{stg}	-40		125	C
Mounting Torque	Screw M5	M	3		6	N.m
Weight of Module		G		340		g

Characteristics Diagrams



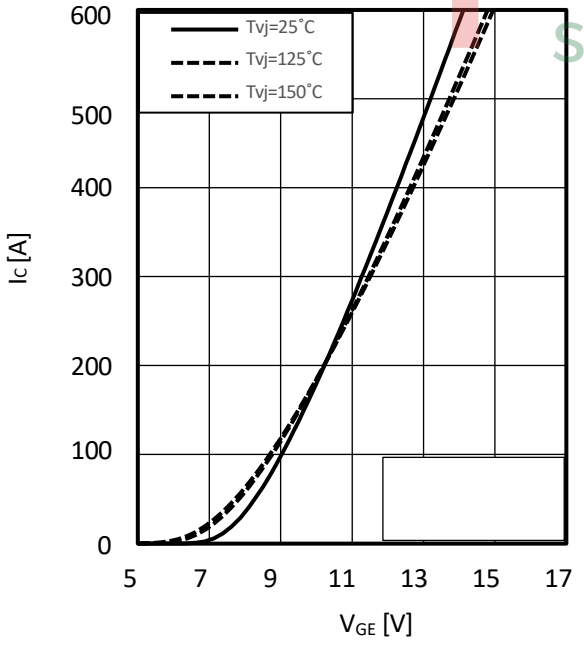
Output characteristic IGBT, Inverter(typical)

$I_C = f(V_{CE}), V_{GE} = 15V$



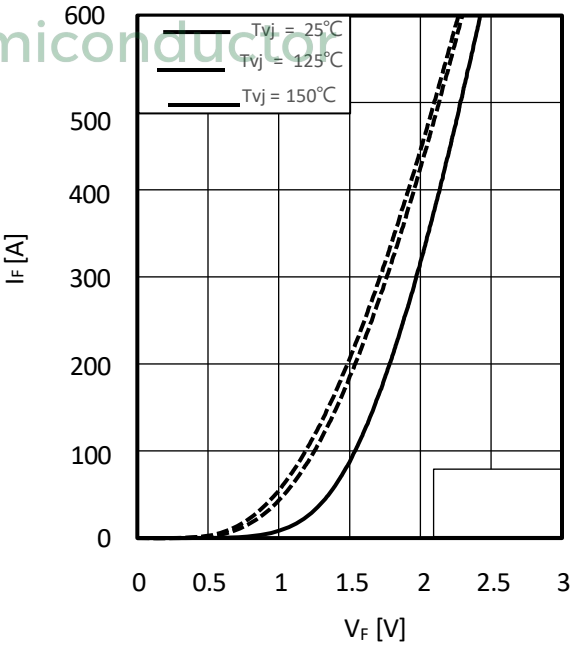
Output characteristic IGBT, Inverter(typical)

$I_C = f(V_{CE})$ $T_{vj} = 150°C$



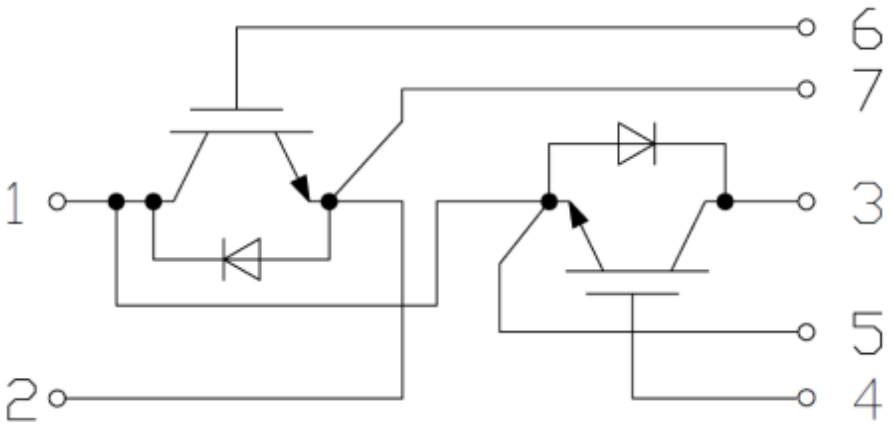
Transfer characteristic IGBT, Inverter(typical)

$I_C = f(V_{GE}), V_{CE} = 20V$



Forward characteristic of Diode, Inverter (typical) $I_F = f(V_F)$

Circuit Diagram



Package Outlines