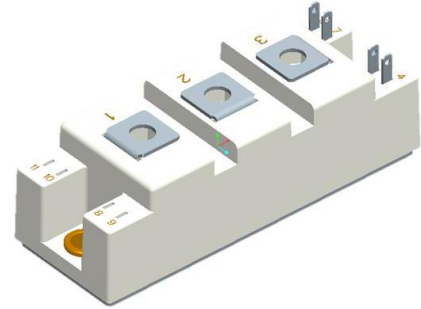


**Key performance:**

- $V_{CE}=1200V$
- $I_C=75A@T_C=100^{\circ}C$
- $V_{CE(sat)}=1.7V$

**Features:**

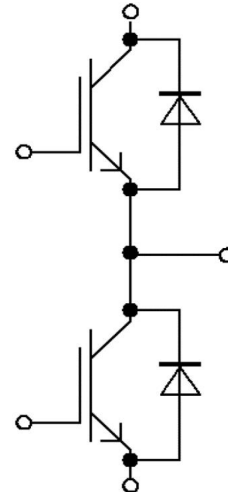
- Low  $V_{CEsat}$ .
- Low switching losses.
- Low stray inductance design.
- Positive  $V_{CEsat}$  temperature coefficient.

**Benefits:**

- High efficiency for application.
- Excellent current sharing in parallel operation.
- RoHS compliant.

**Applications:**

- Welding machine
- High frequency switching converters



**Maximum rated values , IGBT**

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	1200	V
Continuous collector current	$T_C = 100^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	$I_C$	75	A
Repetitive peak collector current	$t_p = 1\text{ ms}$	$I_{CRM}$	150	A
Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	$P_{\text{tot}}$	416	W
Gate-emitter peak voltage		$V_{GES}$	$\pm 20$	V

**Characteristic values , IGBT**

Parameter	Conditions	Symbol	Values			Unit	
			Min.	Typ.	Max		
Collector-emitter saturation voltage	$I_C = 75\text{A}, V_{GE} = 15\text{ V}$	$V_{CESat}$	-	$T_{vj} = 25^{\circ}\text{C}$ 1.70	-	V	
	$T_{vj} = 125^{\circ}\text{C}$ 2.05						
	$T_{vj} = 150^{\circ}\text{C}$ 2.15						
Gate threshold voltage	$I_C = 1\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	$V_{GEth}$	-	5.8	-	V	
Gate charge	$V_{GE} = -15 / 15\text{ V}$	$Q_G$	-	0.54	-	$\mu\text{C}$	
Input capacitance	$f = 100\text{KHz}, T_{vj} = 25^{\circ}\text{C},$ $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$	$C_{ies}$	-	16.44	-	nF	
Reverse transfer capacitance		$C_{res}$	-	0.10	-	nF	
Collector-emitter leakage current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{CES}$	-	-	1.0	mA	
Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$	$I_{GES}$	-	-	200	nA	
Turn-on delay time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = -15 / 15\text{ V}$ $R_G = 5.1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d(on)}$	-	104	-	ns
				-	118		
				-	123		
Rise time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = -15 / 15\text{ V}$ $R_G = 5.1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	-	46	-	ns
				-	55		
				-	59		
Turn-off delay time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = -15 / 15\text{ V}$ $R_G = 5.1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d(off)}$	-	272	-	ns
				-	301		
				-	308		
Fall time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = -15 / 15\text{ V}$ $R_G = 5.1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	-	42	-	ns
				-	105		
				-	110		

Turn-on energy loss per pulse	$I_C = 75A, V_{CE} = 600V$ $V_{GE} = -15 / 15 V$ $R_G = 5.1\Omega$	$T_{vj} = 25^\circ C$ $T_{vj} = 125^\circ C$ $T_{vj} = 150^\circ C$	$E_{on}$	-	2.90 4.30 4.80	-	mJ
Turn-off energy loss per pulse	$I_C = 75A, V_{CE} = 600V$ $V_{GE} = -15 / 15 V$ $R_G = 5.1\Omega$	$T_{vj} = 25^\circ C$ $T_{vj} = 125^\circ C$ $T_{vj} = 150^\circ C$	$E_{off}$	-	2.30 3.40 3.60	-	mJ
Thermal resistance, junction to case	per IGBT		$R_{thJC}$	-	-	0.36	K/W
Thermal resistance, case to heatsink	per IGBT		$R_{thCH}$	-	0.08	-	K/W
Temperature under switching conditions			$T_{vj op}$	-40	-	150	$^\circ C$

### Maximum rated values , Diode

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ C$	$V_{RRM}$	1200	V
Continuous DC forward current		$I_F$	75	A
Repetitive peak forward current	$t_P = 1 ms$	$I_{FRM}$	150	A

### Characteristic values , Diode

Parameter	Conditions	Symbol	Values			Unit	
			Min.	Typ.	Max.		
Forward voltage	$I_F = 75 A, V_{GE} = 0 V$	$V_F$	-	2.40 2.10 2.05	-	V	
Peak reverse recovery current	$I_F = 75 A, V_R = 600V$ $V_{GE} = -15V, R_G = 5.1\Omega$ $- d_{iF}/d_t = 2000 A/\mu s$	$I_{RR}$	-	56 76 81	-	A	
Recovered charge	$I_F = 75 A, V_R = 600V$ $V_{GE} = -15V, R_G = 5.1\Omega$ $- d_{iF}/d_t = 2000 A/\mu s$	$Q_{RR}$	-	3.2 6.2 7.6	-	$\mu C$	
Reverse recovery energy	$I_F = 75 A, V_R = 600V$ $V_{GE} = -15V, R_G = 5.1\Omega$ $- d_{iF}/d_t = 2000 A/\mu s$	$E_{rec}$	-	1.35 2.50 3.10	-	mJ	
Thermal resistance, junction to case	per diode		$R_{thJC}$	-	-	0.92	K/W
Thermal resistance, case to heatsink	per diode		$R_{thCH}$	-	0.16	-	K/W
Temperature under switching conditions			$T_{vj op}$	-40	-	150	$^\circ C$

**Module characteristic values**

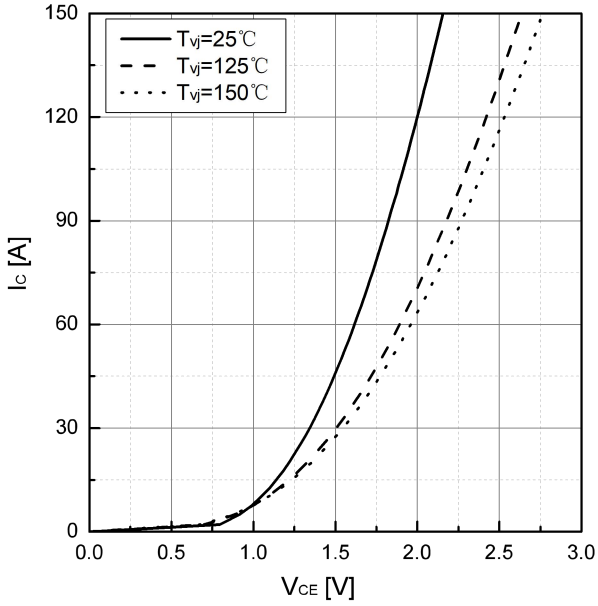
Parameter	Conditions	Symbol	Values	Unit
Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	$V_{ISOL}$	2.5	kV
Internal isolation	basic insulation (class 1, IEC 61140)		Al <sub>2</sub> O <sub>3</sub>	
Creepage distance	terminal to heatsink		17	mm
	terminal to terminal		20	
Clearance	terminal to heatsink		17	mm
	terminal to terminal		9.5	
Comperative tracking index		CTI	> 200	

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Stray inductance module		$L_{sCE}$	-	35	-	nH
Module lead resistance, terminals - chip	$T_C = 25^\circ\text{C}$ , per switch	$R_{CC+EE'}$	-	0.7	-	mΩ
Storage temperature		Tstg	-40	-	125	°C
Mounting torque	Screw:M6	M	3	-	5	Nm
Terminal connection torque	Screw:M5	M	2.5	-	5	Nm
Weight		G	-	164	-	g

**Output characteristic, IGBT**

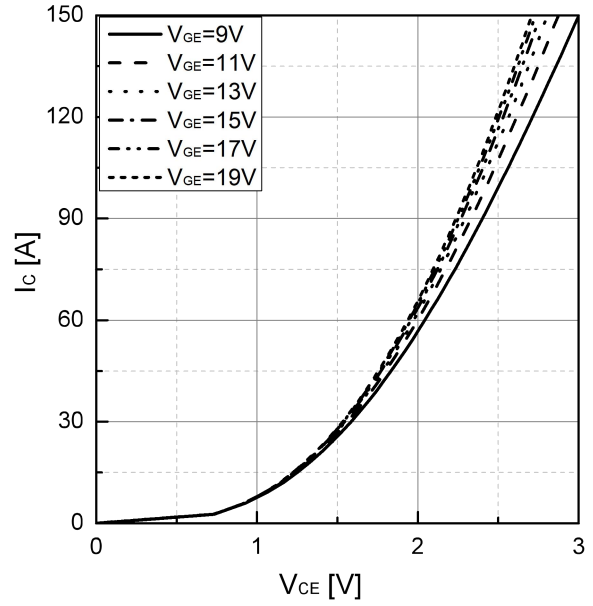
$$I_C = f(V_{CE})$$

$$V_{GE} = 15V$$


**Output characteristic, IGBT**

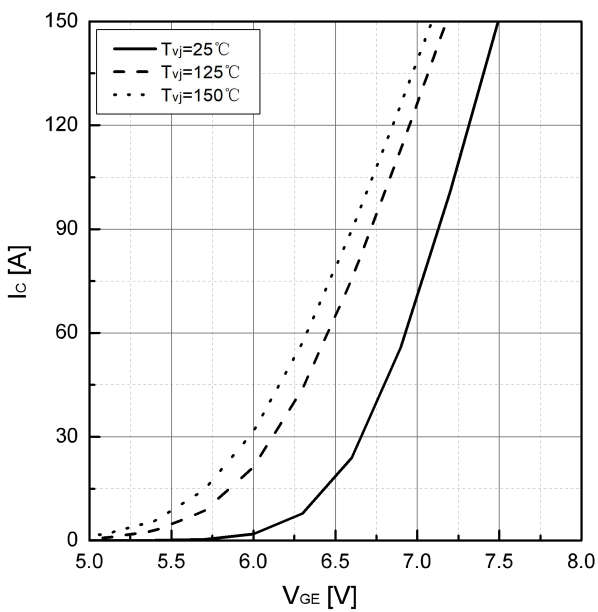
$$I_C = f(V_{CE})$$

$$T_{vj} = 150^\circ C$$


**Transfer characteristic, IGBT**

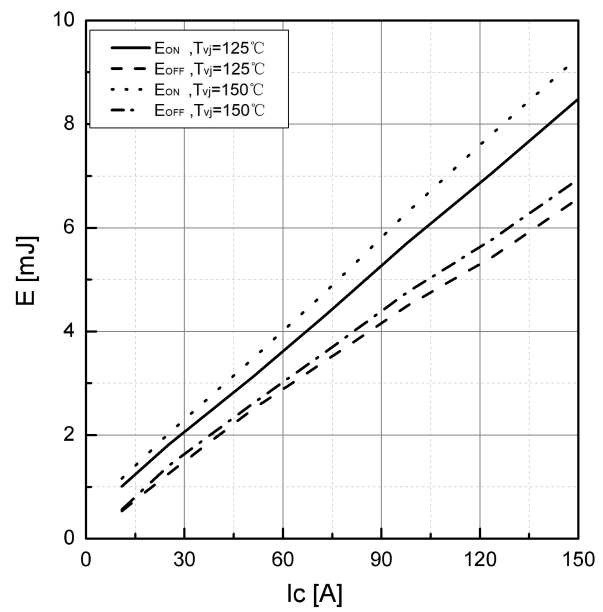
$$I_C = f(V_{GE})$$

$$V_{CE} = 20V$$


**Switching losses vs. I\_C, IGBT**

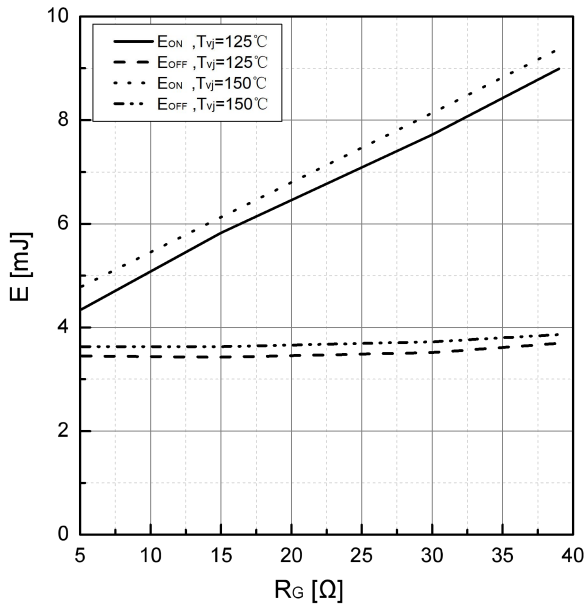
$$E_{on} = f(I_C), E_{off} = f(I_C)$$

$$V_{CE} = 600V, V_{GE} = 15/-15V, R_G = 5.1 \Omega$$

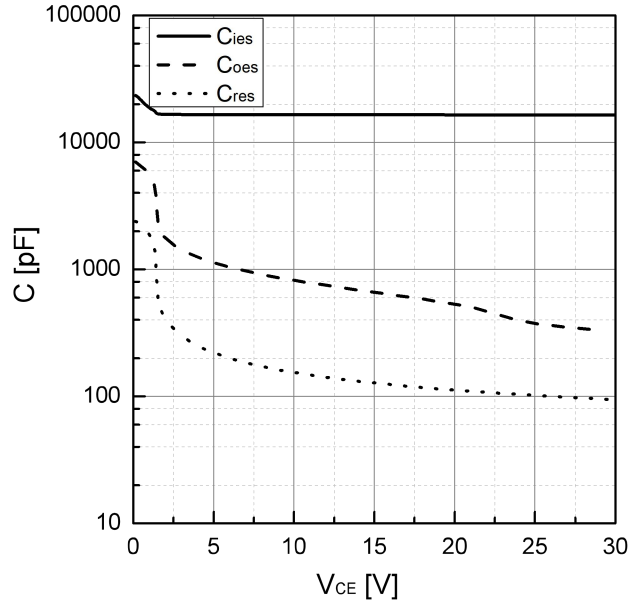


**Switching losses vs.  $R_G$ , IGBT**

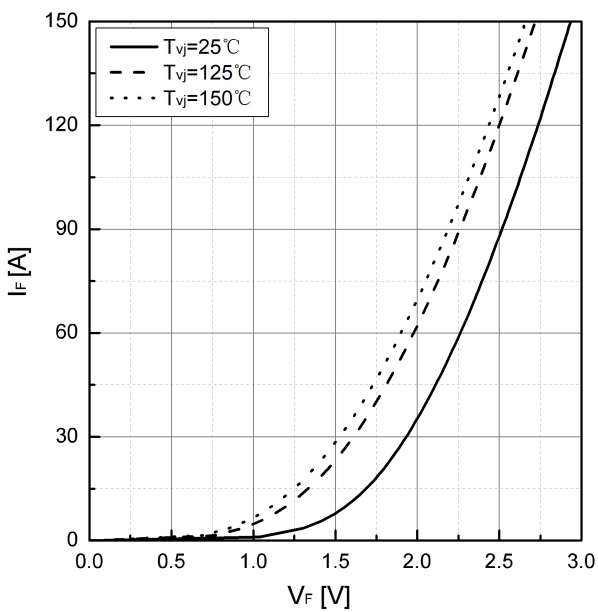
$$E_{on}=f(R_G), E_{off}=f(R_G)$$

 $V_{CE}=600V, V_{GE}=15/-15V, I_C=75A$ 

**Capacity characteristic, IGBT**

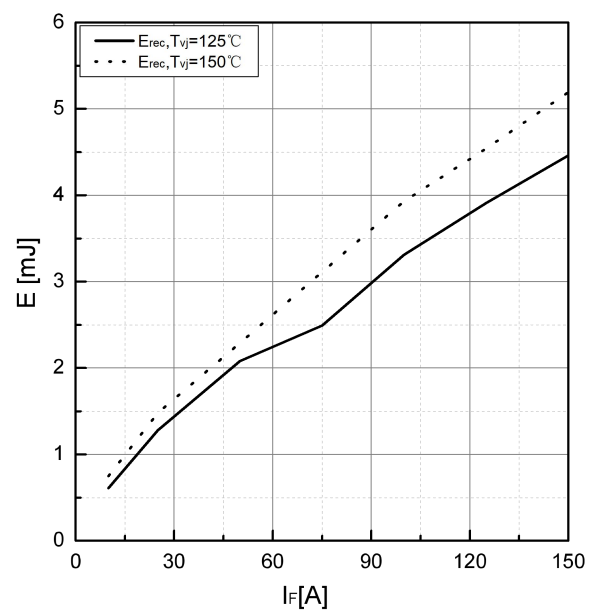
$$C=f(V_{CE})$$

 $f=100KHz, V_{GE}=0V, T_{vj}=25^{\circ}C$ 

**Forward characteristic, Diode**

$$I_F=f(V_F)$$

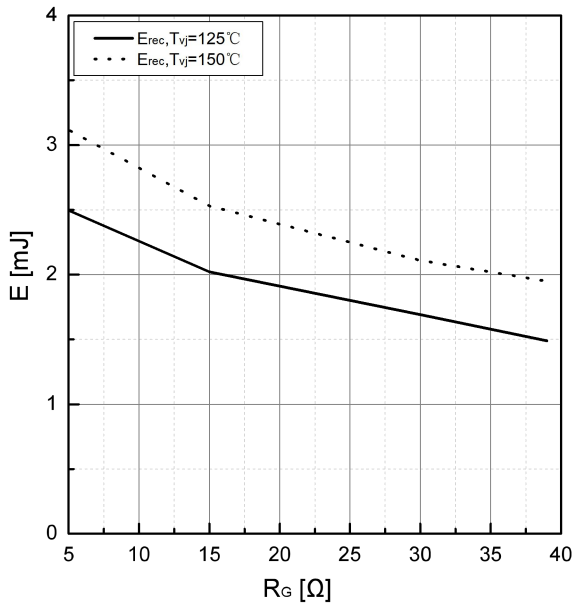
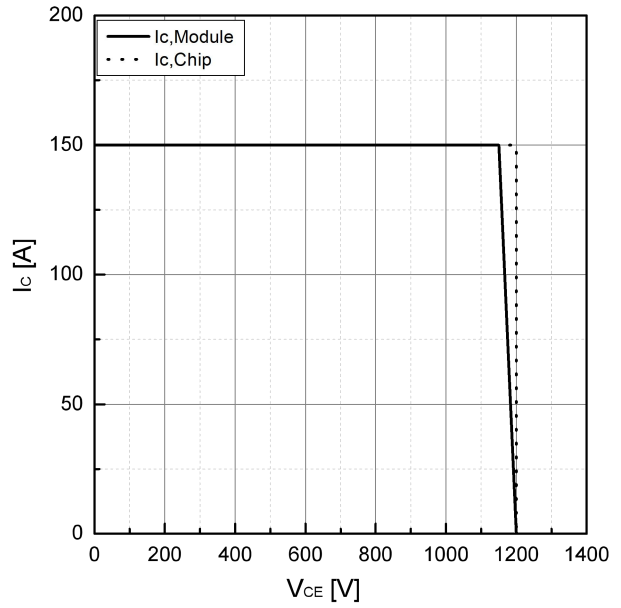

**Switching losses vs.  $I_F$ , Diode**

$$E_{rec}=f(I_F)$$

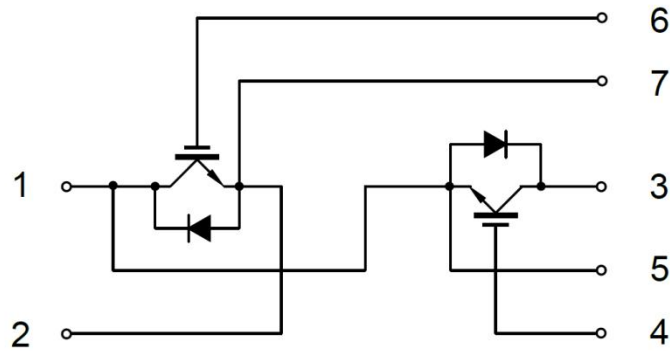
 $V_R=600V, R_G=5.1 \Omega$ 


**Switching losses vs.  $R_G$ , Diode**

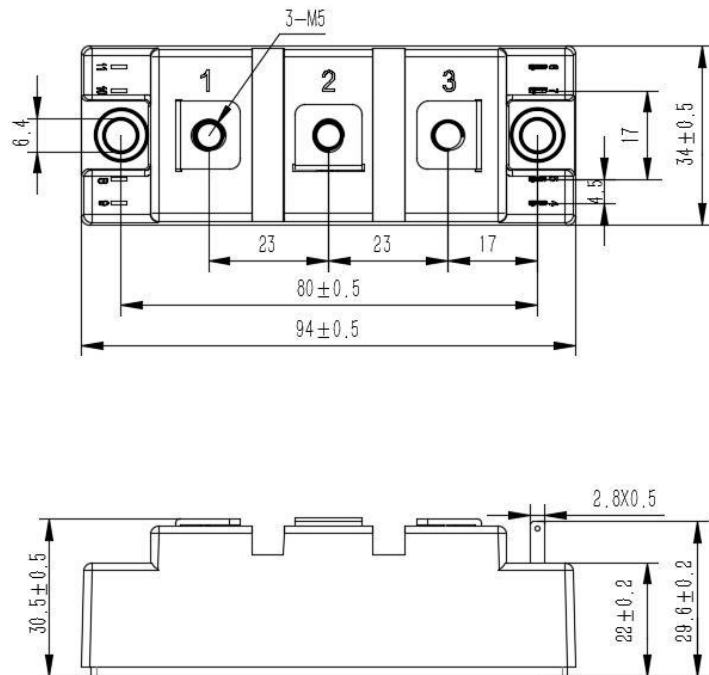
$$E_{rec} = f(R_G)$$

 $V_R = 600V, I_F = 75A$ 

**Reverse bias safe operating area (RBSOA)**
 $V_{CE} = 600V, V_{GE} = 15/-15V, R_G = 5.1 \Omega$ 


### Circuit diagram



### Package outlines (mm)





## Revision history

Date	Revision	Changes
Sep 17, 2024	Rev 1.0	Release of the final datasheet.

## Disclaimer

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