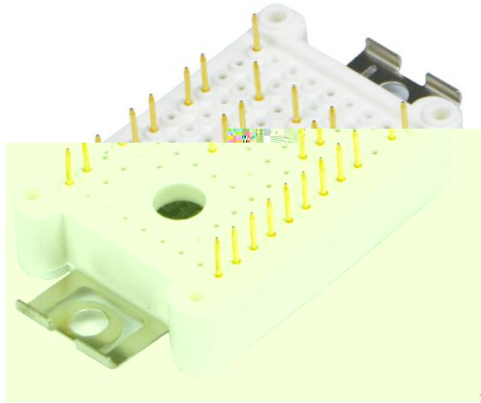


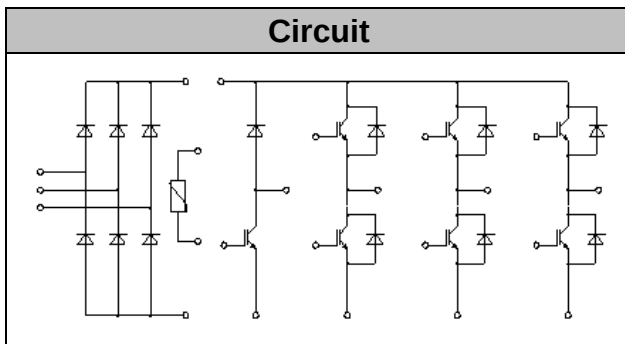


## IGBT Modules

|           |       |
|-----------|-------|
| $V_{CES}$ | 1200V |
| $I_C$     | 15A   |

## Applications

Motor Drivers  
AC and DC Servo Drive Amplifier  
UPS (Uninterruptible Power Supplies)



## Features

Low switching losses  
Low  $V_{CE(sat)}$  with positive temperature coefficient  
Including fast & soft recovery anti-parallel FWD  
Low inductance case  
High short circuit capability(10us)  
Isolated heatsink using DBC technology  
Maximum junction temperature 175°C

## ● IGBT- inverter

### Absolute Maximum Ratings

| Parameter                         | Symbol    | Conditions                      | Value | Unit |
|-----------------------------------|-----------|---------------------------------|-------|------|
| Collector-Emitter Voltage         | $V_{CES}$ | $V_{GE}=0V, I_C=1mA, T_{vj}=25$ | 1200  | V    |
| Continuous Collector Current      | $I_C$     | $T_C=100, T_{vjmax} 175$        | 15    | A    |
| Repetitive Peak Collector Current | $I_{CRM}$ | $t_p=1ms$                       | 30    | A    |
| Gate-Emitter Voltage              | $V_{GES}$ | $T_{vj}=25$                     | 20    | V    |
| Total Power Dissipation           | $P_{tot}$ | $T_C=25$<br>$T_{vjmax}=175$     | 130   | W    |



# MG15P12P2



## ● IGBT- inverter

### Characteristic Values

| Parameter                               | Symbol        | Conditions                                                                                 | Value |       |      | Unit |
|-----------------------------------------|---------------|--------------------------------------------------------------------------------------------|-------|-------|------|------|
|                                         |               |                                                                                            | Min.  | Typ.  | Max. |      |
| Gate-Emitter Threshold Voltage          | $V_{GE(th)}$  | $V_{GE}=V_{CE}$ , $I_C=0.5mA$ , $T_{vj}=25$                                                | 5.2   | 5.9   | 6.5  | V    |
| Collector-Emitter Cut-off Current       | $I_{CES}$     | $V_{CE}=1200V$ , $V_{GE}=0V$ , $T_{vj}=25$                                                 |       |       | 1.0  | mA   |
| Collector-Emitter Saturation Voltage    | $V_{CE(sat)}$ | $I_C=15A$ , $V_{GE}=15V$ , $T_{vj}=25$                                                     |       | 1.9   | 2.5  | V    |
|                                         |               | $I_C=15A$ , $V_{GE}=15V$ , $T_{vj}=125$                                                    |       | 2.1   |      |      |
|                                         |               | $I_C=15A$ , $V_{GE}=15V$ , $T_{vj}=150$                                                    |       | 2.2   |      |      |
| Gate Charge                             | $Q_G$         |                                                                                            |       | 0.15  |      | uC   |
| Input Capacitance                       | $C_{ies}$     | $V_{CE}=25V$ , $V_{GE}=0V$ ,<br>$f=1MHz$ , $T_{vj}=25$                                     |       | 0.98  |      | nF   |
| Reverse Transfer Capacitance            | $C_{res}$     |                                                                                            |       | 0.034 |      | nF   |
| Gate-Emitter leakage current            | $I_{GES}$     | $V_{CE}=0V$ , $V_{GE}=20V$ , $T_{vj}=25$                                                   |       |       | 400  | nA   |
| Turn-on Delay Time                      | $t_{d(on)}$   | $I_C=15A$<br>$V_{CE}=600V$<br>$V_{GE}=\pm 15V$<br>$R_G=39\Omega$<br>$T_{vj}=25$            |       | 61    |      | ns   |
| Rise Time                               | $t_r$         |                                                                                            |       | 29    |      | ns   |
| Turn-off Delay Time                     | $t_{d(off)}$  |                                                                                            |       | 89    |      | ns   |
| Fall Time                               | $t_f$         |                                                                                            |       | 311   |      | ns   |
| Energy Dissipation During Turn-on Time  | $E_{on}$      |                                                                                            |       | 1.98  |      | mJ   |
| Energy Dissipation During Turn-off Time | $E_{off}$     |                                                                                            |       | 0.99  |      | mJ   |
| Turn-on Delay Time                      | $t_{d(on)}$   | $I_C=15A$<br>$V_{CE}=600V$<br>$V_{GE}=\pm 15V$<br>$R_G=39\Omega$<br>$T_{vj}=150$           |       | 60    |      | ns   |
| Rise Time                               | $t_r$         |                                                                                            |       | 32    |      | ns   |
| Turn-off Delay Time                     | $t_{d(off)}$  |                                                                                            |       | 89    |      | ns   |
| Fall Time                               | $t_f$         |                                                                                            |       | 319   |      | ns   |
| Energy Dissipation During Turn-on Time  | $E_{on}$      |                                                                                            |       | 2.15  |      | mJ   |
| Energy Dissipation During Turn-off Time | $E_{off}$     |                                                                                            |       | 1.13  |      | mJ   |
| SC Data                                 | $I_{SC}$      | $t_p \leq 10\mu s$ , $V_{GE}=15V$ , $T_{vj}=150$ ,<br>$V_{CC}=900V$ , $V_{CEM} \leq 1200V$ |       | 55    |      | A    |



# MG15P12P2



## ● Diode-inverter

### Absolute Maximum Ratings

| Parameter                       | Symbol    | Conditions                     | Value | Unit   |
|---------------------------------|-----------|--------------------------------|-------|--------|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | $T_{vj}=25$                    | 1200  | V      |
| Continuous DC Forward Current   | $I_F$     |                                | 15    | A      |
| Repetitive Peak Forward Current | $I_{FRM}$ | $t_p=1ms$                      | 30    | A      |
| $I^2t$ -value                   | $I^2t$    | $V_R=0V, t_p=10ms, T_{vj}=125$ | 16.0  | $A^2s$ |
|                                 |           | $V_R=0V, t_p=10ms, T_{vj}=150$ | 14.0  |        |

### Characteristic Values

| Parameter | Symbol | Conditions | Value |      | Unit |
|-----------|--------|------------|-------|------|------|
|           |        |            | Min.  | Typ. |      |



# MG15P12P2



## ● IGBT-brake-chopper

### Absolute Maximum Ratings

| Parameter                 | Symbol    | Conditions                      | Value | Unit |
|---------------------------|-----------|---------------------------------|-------|------|
| Collector-Emitter Voltage | $V_{CES}$ | $V_{GE}=0V, I_C=1mA, T_{vj}=25$ | 1200  | V    |



# MG15P12P2

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# MG15P12P2

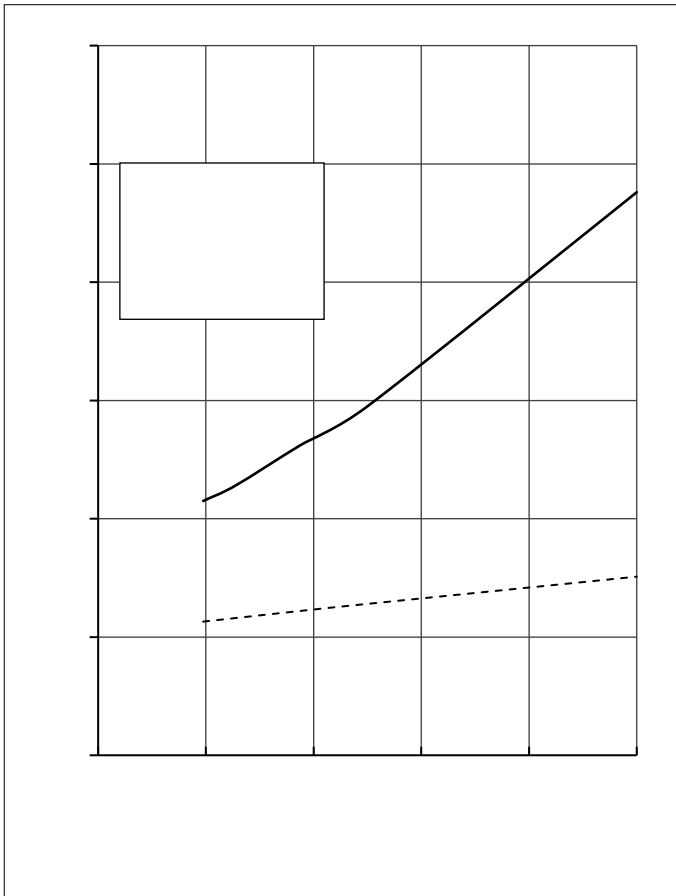
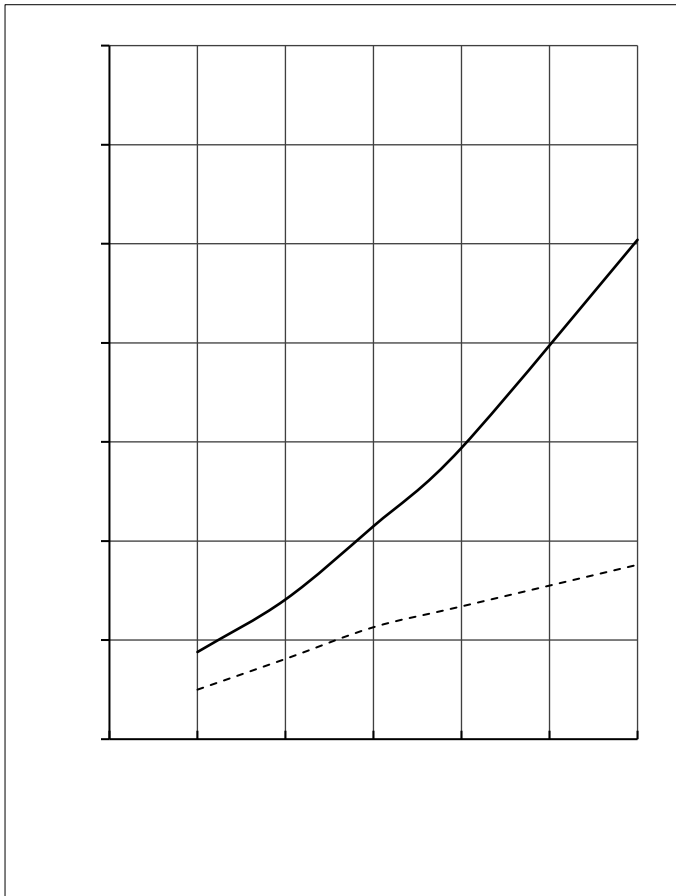
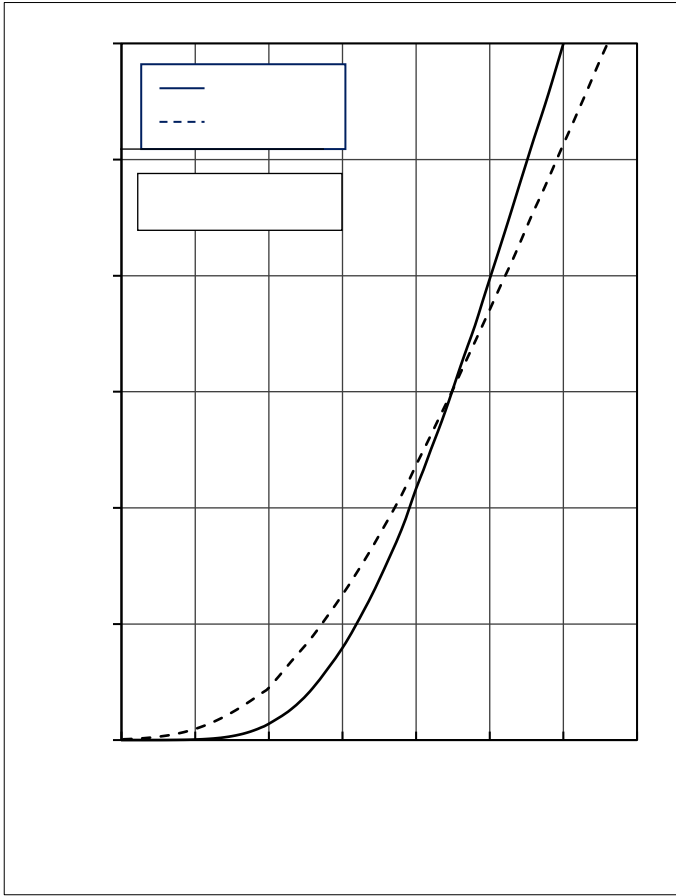
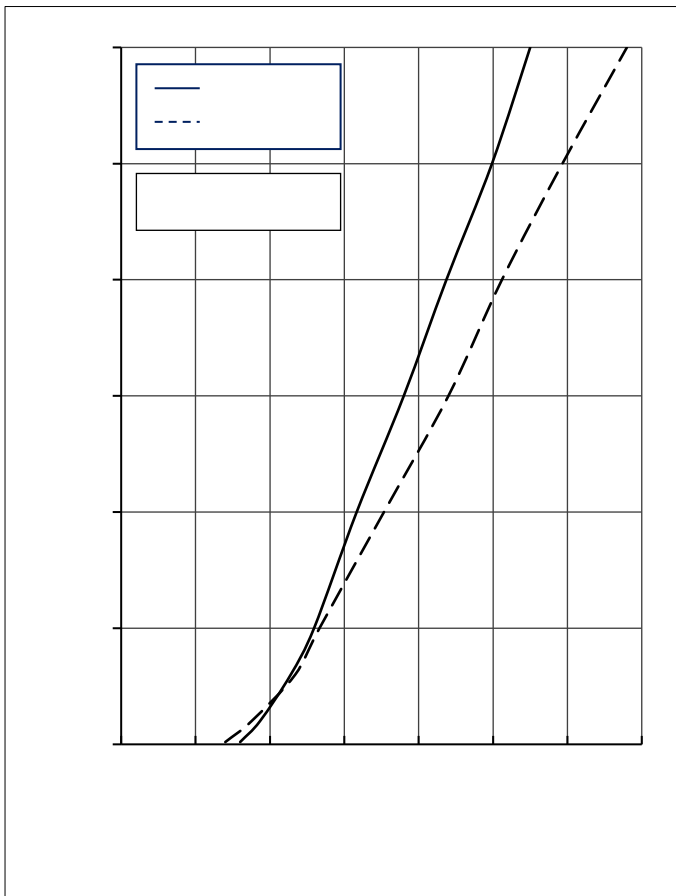


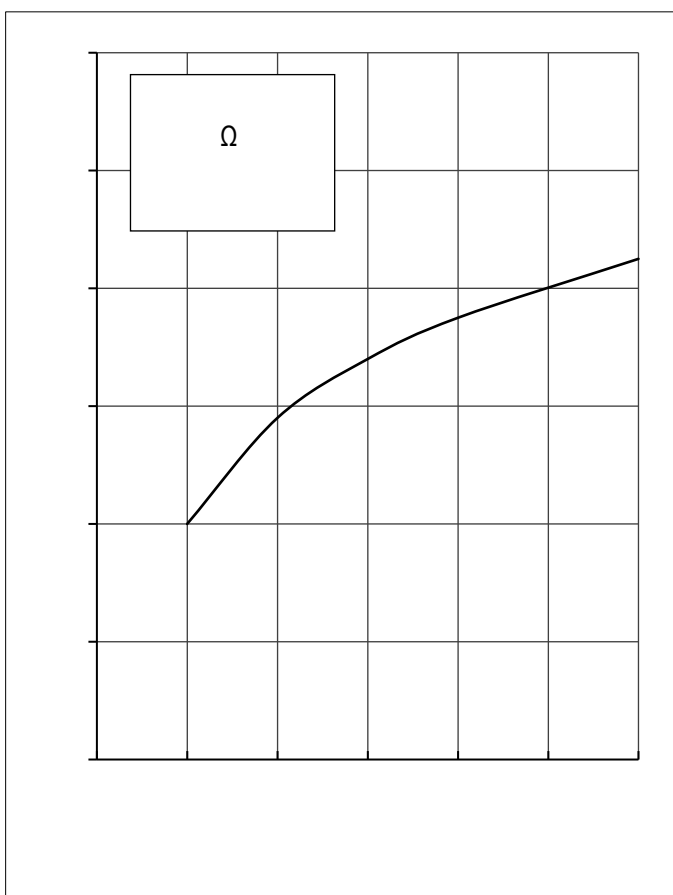
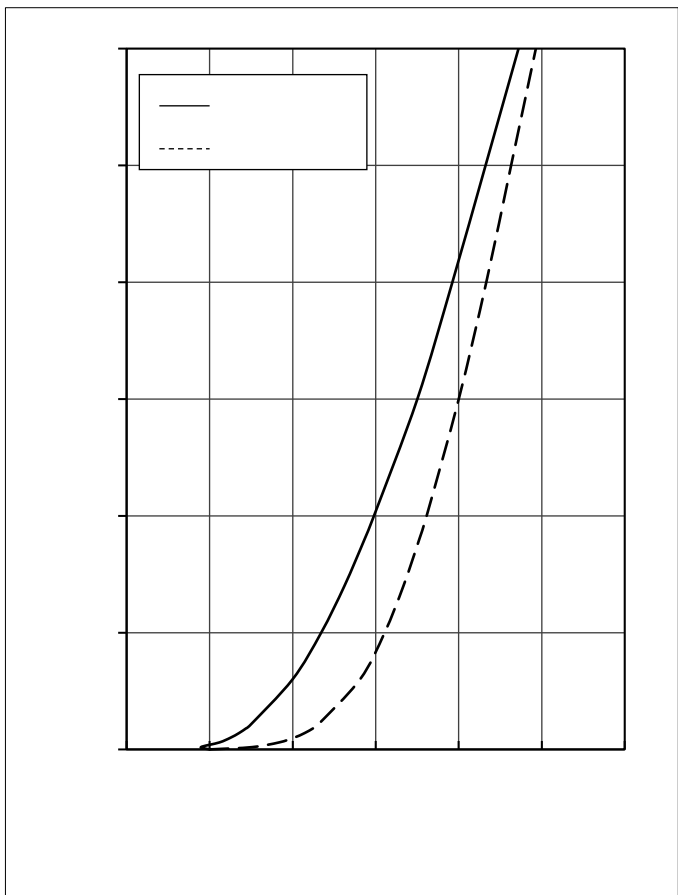
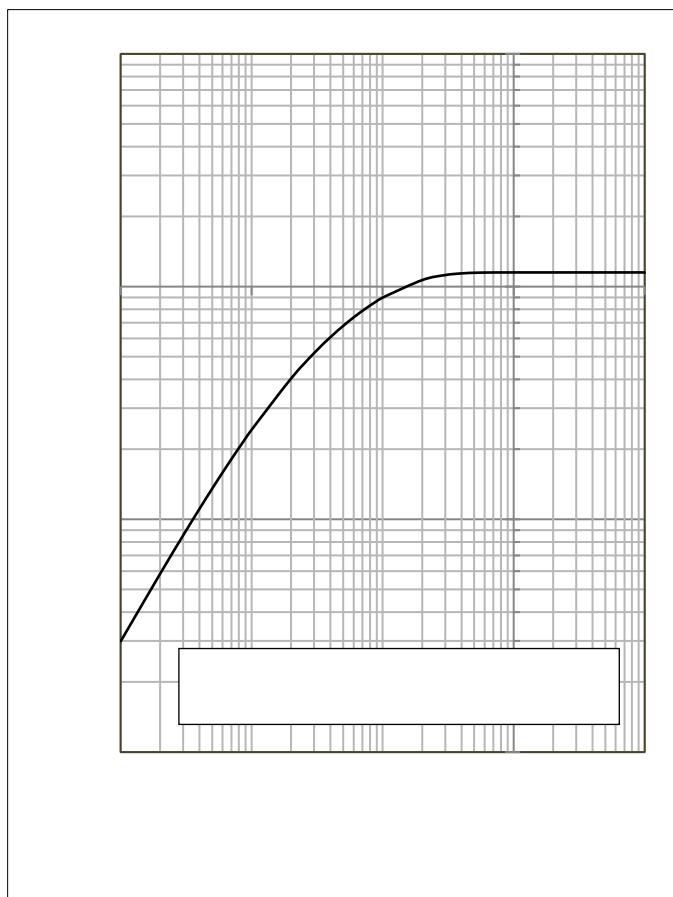
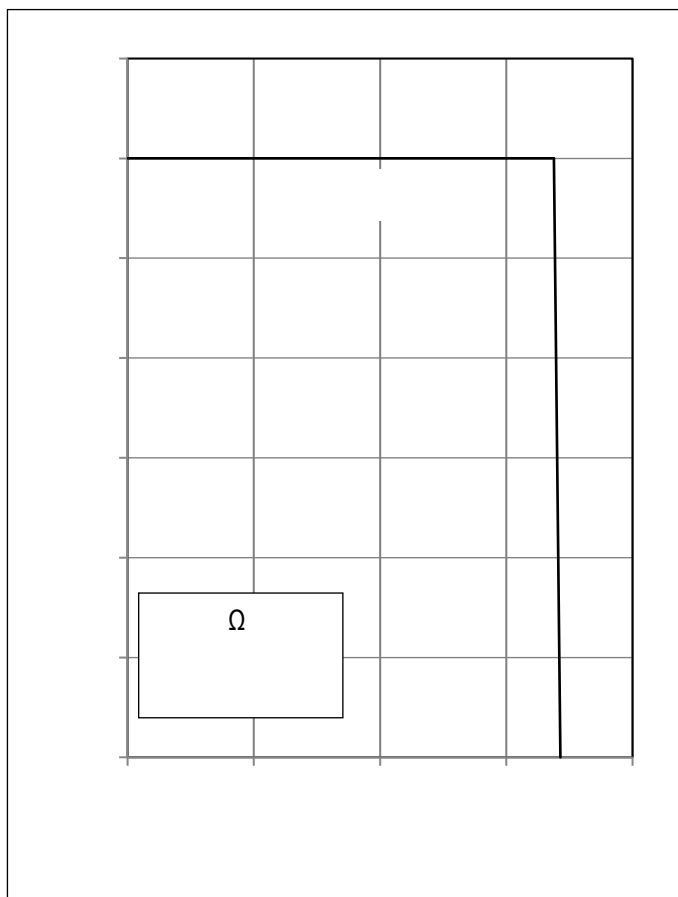
## ● Module Characteristics

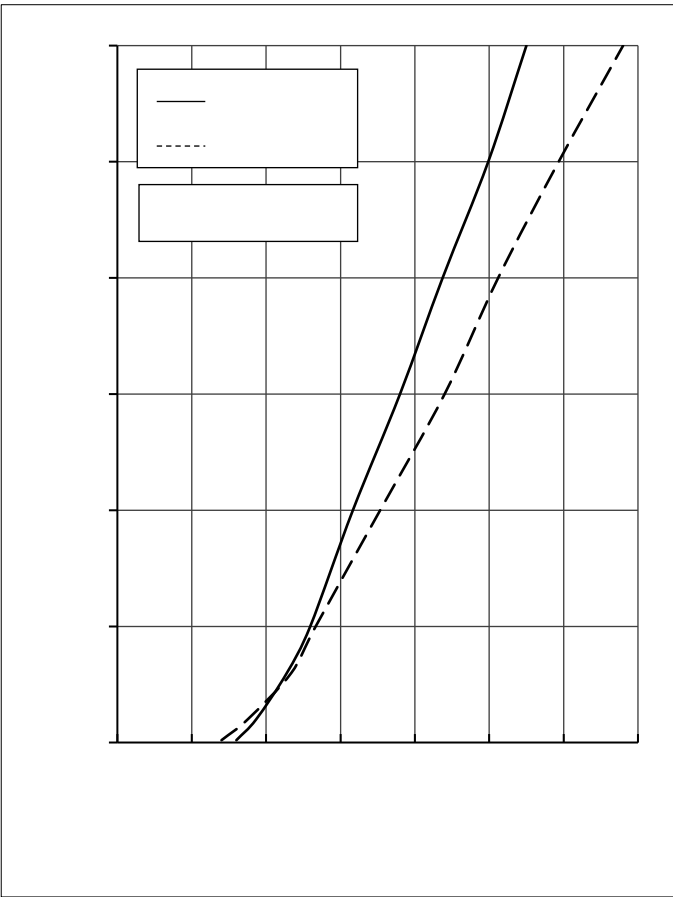
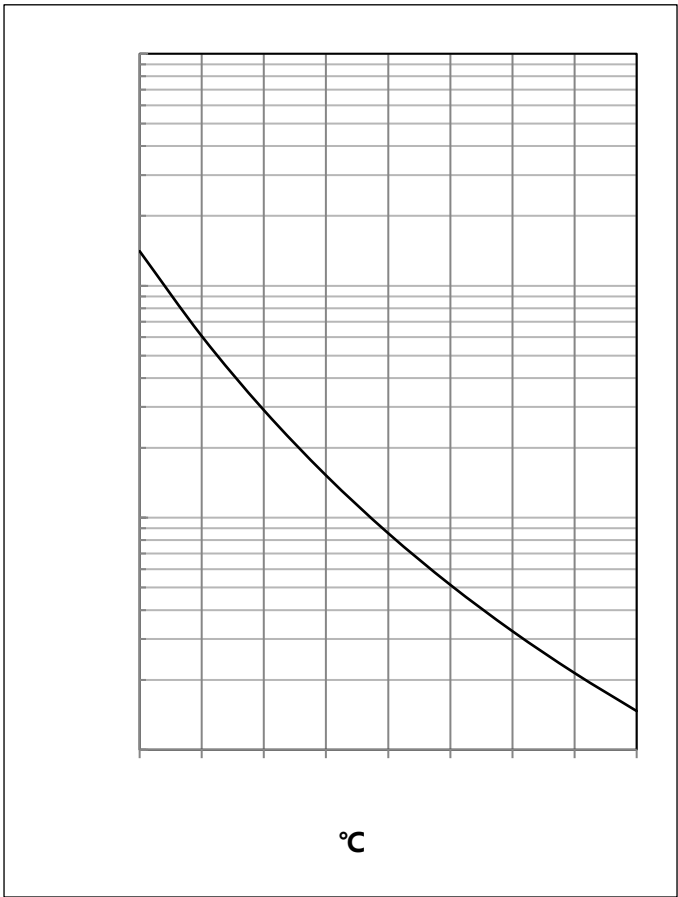
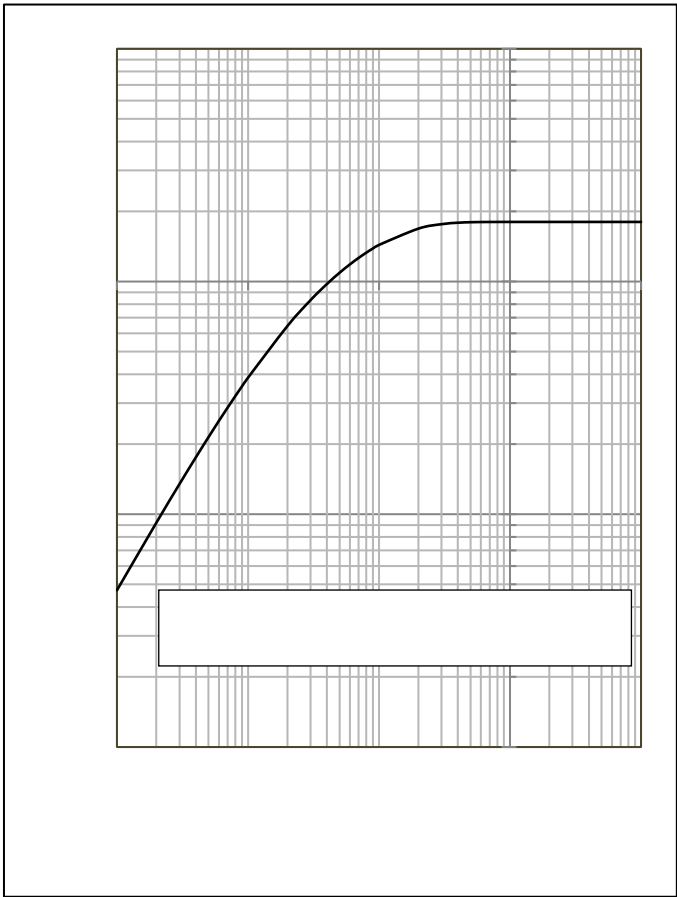
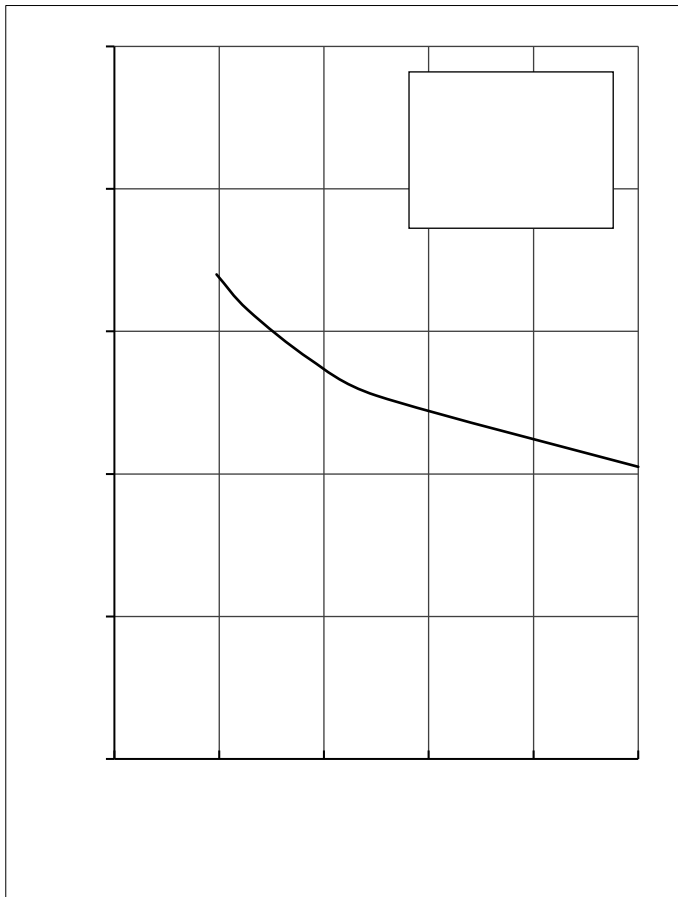
$T_C=25^{\circ}\text{C}$  unless otherwise specified

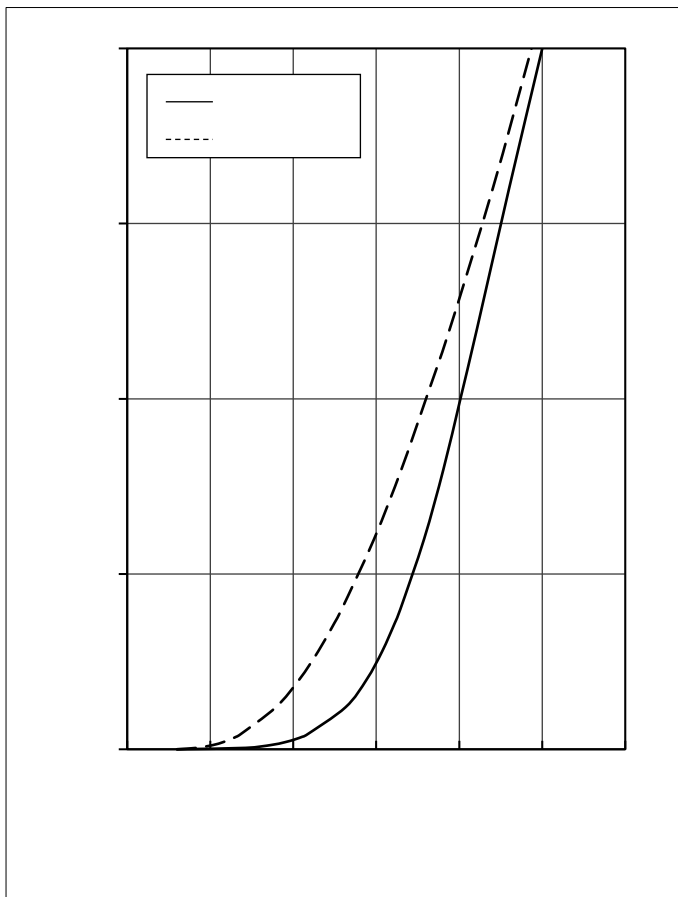
| Parameter                      | Symbol             | Conditions                     | Value |      |      | Unit |
|--------------------------------|--------------------|--------------------------------|-------|------|------|------|
|                                |                    |                                | Min.  | Typ. | Max. |      |
| Isolation Voltage              | $V_{\text{isol}}$  | $t=1\text{min}, f=50\text{Hz}$ | 2500  |      |      | V    |
| Maximum Junction Temperature   | $T_{\text{jmax}}$  |                                |       |      | 175  |      |
| Operating Junction Temperature | $T_{\text{vj op}}$ |                                | -40   |      | 150  |      |
| Storage Temperature            | $T_{\text{stg}}$   |                                | -40   |      | 125  |      |
| Stray-inductance-module        | $L_{\text{SCE}}$   |                                |       | 30   |      | nH   |

Module lead



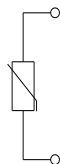








## Circuit Diagram



## ● Package Dimensions





## Disclaimer

b c b b ba a b c b b b b b b ) a  
b b b b b b b c b b c c b a a ba b b b  
b )c ab b b b b a b b b b ) a ab ba  
b a ba b b ab ba b ba a b b b b ab b ) a ab ba  
b ba b b ab b b b b b b c b a b c c a a b  
b a b d b b b b b ) b b b ) c b b a b d  
ab b & b b b b c ) b b c a b b c  
b b c b b b c b ba C aa c ) b b  
b b , , / b ) b b b b c b c b b