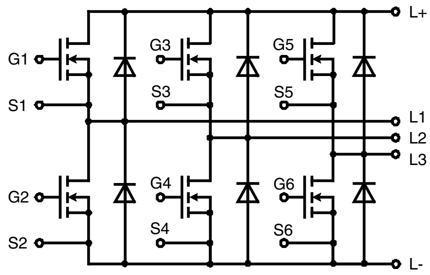
Three phase full Bridge

with Trench MOSFETs
in DCB isolated high current package

V_{DSS} = 75 V
I_{D25} = 110 A
$R_{DSon\ typ.}$ = 4.0 mΩ



Straight leads

Surface Mount Device

MOSFETs			
Symbol	**Conditions**	**Maximum Ratings**	
V_{DSS}	T_{VJ} = 25°C to 150°C	75	V
V_{GS}		± 20	V
I_{D25}	T_C = 25°C	110	A
I_{D90}	T_C = 90°C	85	A
I_{F25}	T_C = 25°C (diode)	110	A
I_{F90}	T_C = 90°C (diode)	80	A

Symbol	**Conditions**		**Characteristic Values** (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
R_{DSon}	on chip level at V_{GS} = 10 V; I_D = 60 A	T_{VJ} = 25°C		4.0	4.9	mΩ
		T_{VJ} = 125°C		7.2	8.4	mΩ
$V_{GS(th)}$	V_{DS} = 20 V; I_D = 1 mA		2		4	V
I_{DSS}	V_{DS} = V_{DSS}; V_{GS} = 0 V	T_{VJ} = 25°C			1	µA
		T_{VJ} = 125°C		0.1		mA
I_{GSS}	V_{GS} = ± 20 V; V_{DS} = 0 V				0.2	µA
Q_g	V_{GS} = 10 V; V_{DS} = 36 V; I_D = 25 A			115		nC
Q_{gs}				30		nC
Q_{gd}				30		nC
$t_{d(on)}$	V_{GS} = 10 V; V_{DS} = 30 V; I_D = 80 A; R_G = 39 Ω; inductive load	T_{VJ} = 125°C		130		ns
t_r				100		ns
$t_{d(off)}$				500		ns
t_f				100		ns
E_{on}				0.20		mJ
E_{off}				0.50		mJ
E_{recoff}				0.01		mJ
R_{thJC}					1.0	K/W
R_{thJH}	with heat transfer paste (IXYS test setup)			1.3	1.6	K/W

Applications

AC drives
- in automobiles
  - electric power steering
  - starter generator
- in industrial vehicles
  - propulsion drives
  - fork lift drives
- in battery supplied equipment

Features

- MOSFETs in trench technology:
  - low RDSon
  - optimized intrinsic reverse diode
- package:
  - high level of integration
  - high current capability 300 A max.
  - aux. terminals for MOSFET control
  - terminals for soldering or welding connections
  - isolated DCB ceramic base plate with optimized heat transfer
- Space and weight savings

Package options

- 2 lead forms available
  - straight leads (SL)
  - SMD lead version (SMD)

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Source-Drain Diode					
Symbol	**Conditions**	**Characteristic Values**			
	(T_J = 25°C, unless otherwise specified)	**min.**	**typ.**	**max.**	
V_{SD}	(diode) I_F = 80 A; V_{GS} = 0 V		0.9	1.2	V
t_{rr}	I_F = 80 A; -di_F/dt = 800 A/µs V_R = 30 V; T_J = 125°C		55		ns
Q_{RM}			0.9		µC
I_{RM}			30		A

Component			
Symbol	**Conditions**	**Maximum Ratings**	
I_{RMS}	per pin in main current paths (P+, N-, L1, L2, L3) may be additionally limited by external connections	300	A
T_{VJ}		-55...+175	°C
T_{stg}		-55...+125	°C
V_{ISOL}	I_{ISOL} ≤ 1 mA, 50/60 Hz, f = 1 minute	1000	V~
F_C	mounting force with clip	50 - 250	N

Symbol	**Conditions**	**Characteristic Values**			
		min.	**typ.**	**max.**	
$R_{pin\ to\ chip}$	with heatsink compound		0.6		mΩ
C_P	coupling capacity between shorted pins and mounting tab in the case		160		pF
Weight	typ.		25		g

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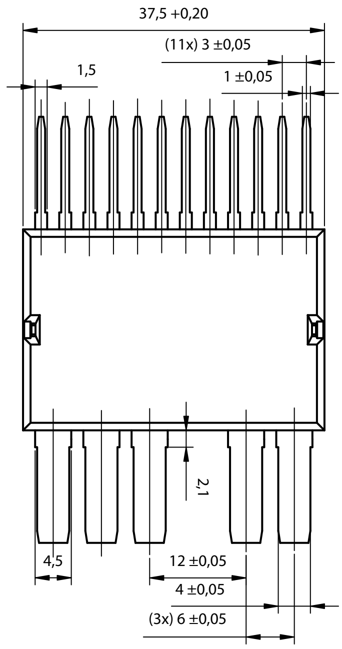
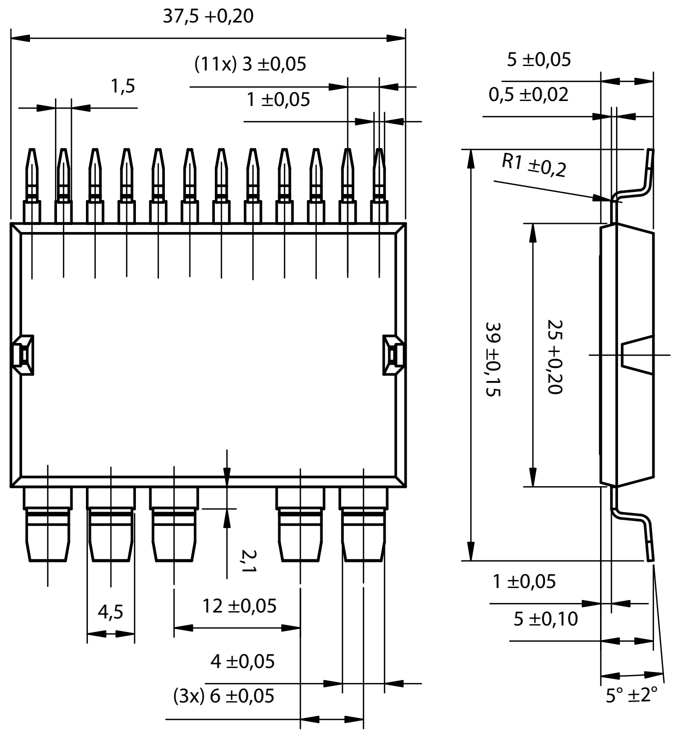
Straight Leads GWM 120-0075X1-SL



Surface Mount Device GWM 120-0075X1-SMD



Leads	Ordering	Part Name & Packing Unit Marking	Part Marking	Delivering Mode	Base Qty.	Ordering Code
Straight	Standard	GWM 120-0075X1 - SL	GWM 120-0075X1	Blister	28	505 960
SMD	Standard	GWM 120-0075X1 - SMD	GWM 120-0075X1	Blister	28	505 581

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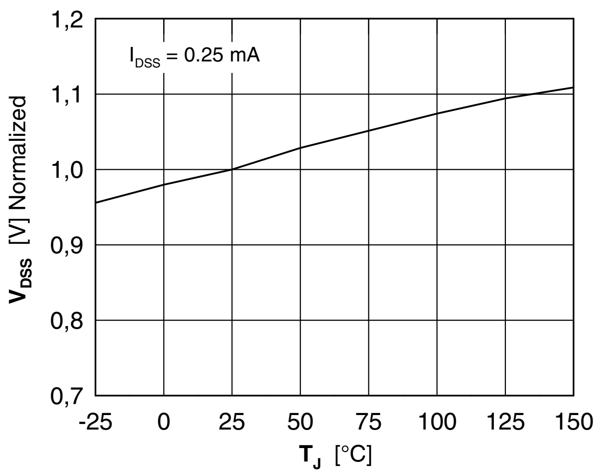

Fig. 1 Drain source breakdown voltage V_{DSS} vs. junction temperature T_{VJ}

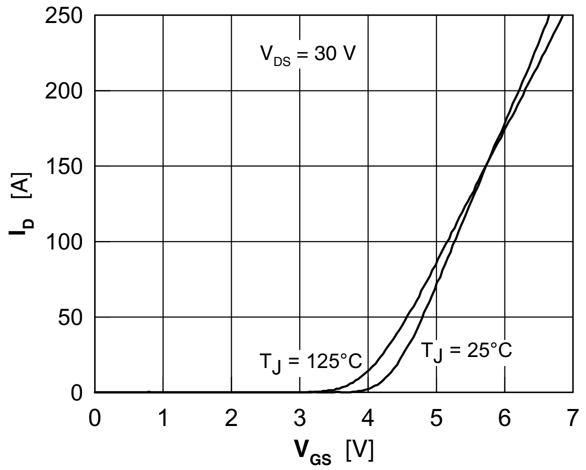

Fig. 2 Typical transfer characteristic

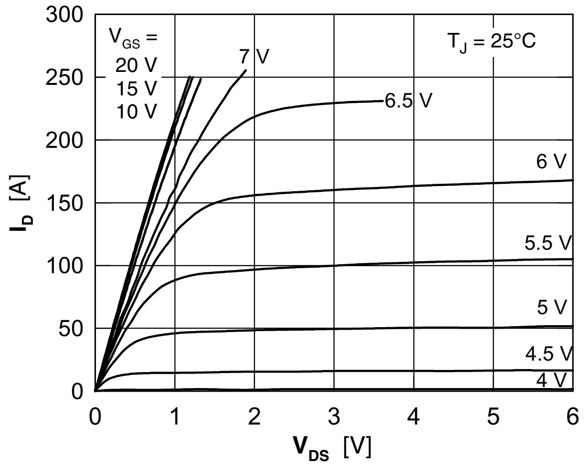

Fig. 3 Typical output characteristic

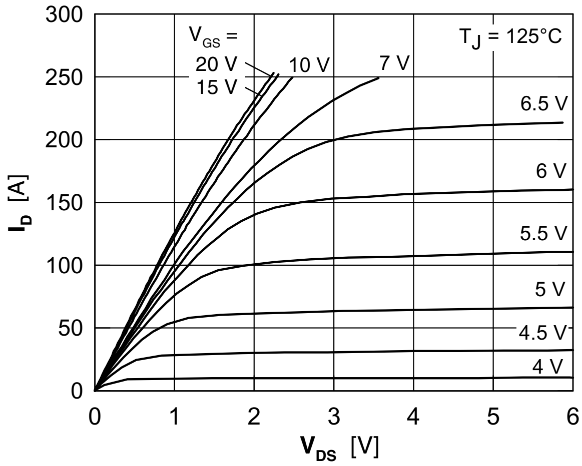

Fig. 4 Typical output characteristic

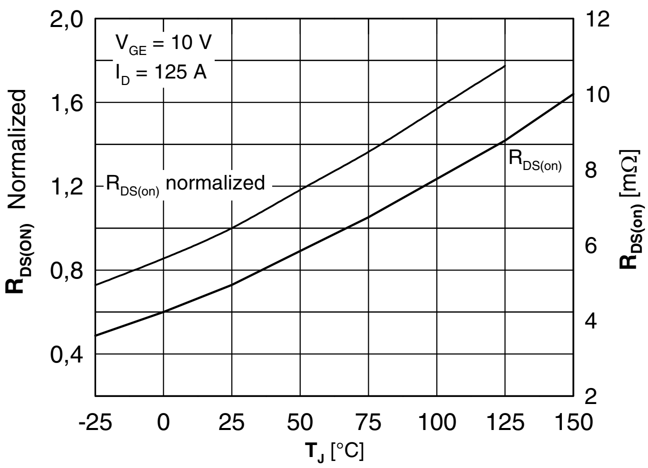

Fig. 5 Drain source on-state resistance $R_{DS(on)}$ versus junction temperature T_J

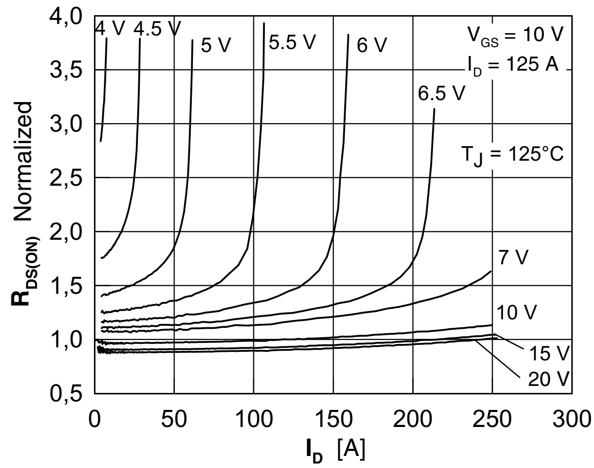

Fig. 6 Drain source on-state resistance $R_{DS(on)}$ versus I_D

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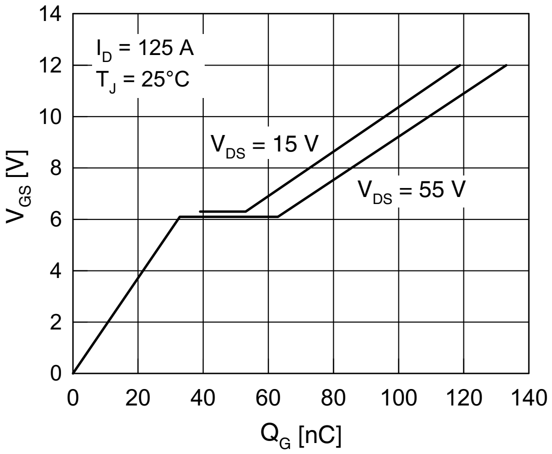

Fig.7 Gate charge characteristic

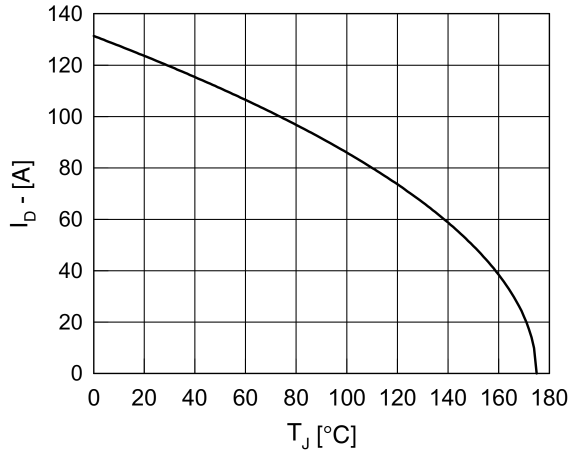

Fig. 8 Drain current I_D vs. case temperature T_C

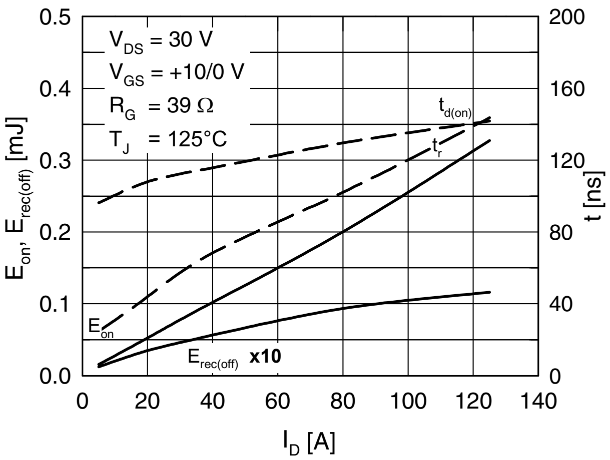

Fig. 9 Typ. turn-on energy & switching times vs. collector current, inductive switching

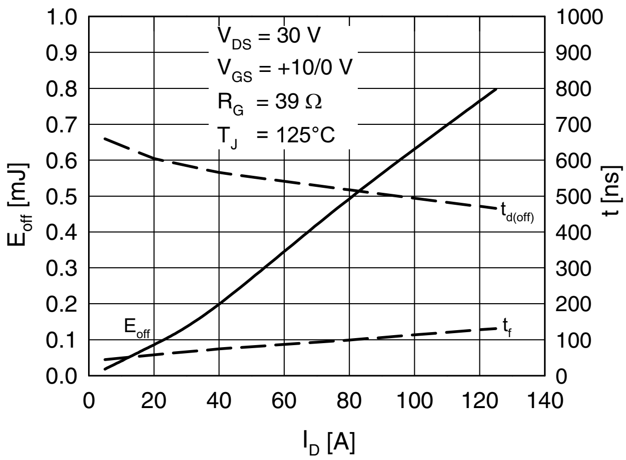

Fig. 10 Typ. turn-off energy & switching times vs. collector current, inductive switching

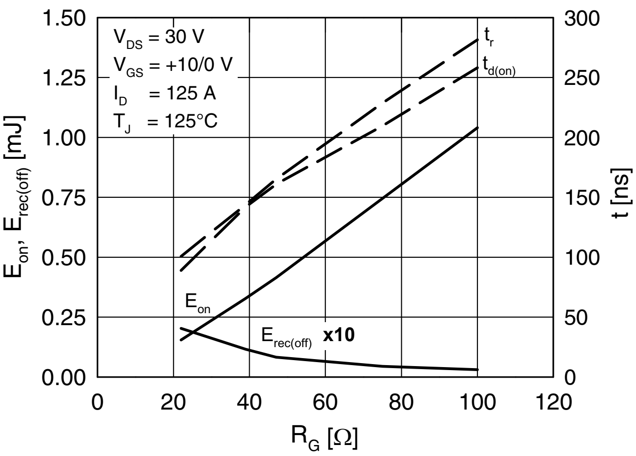

Fig. 11 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

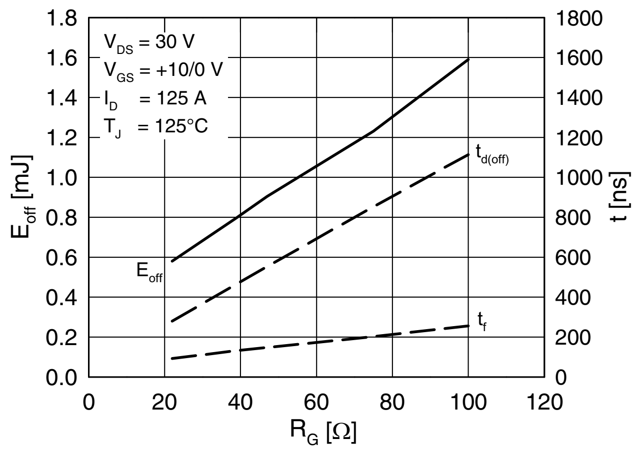

Fig. 12 Typ. turn-off energy & switching times vs. gate resistor, inductive switching

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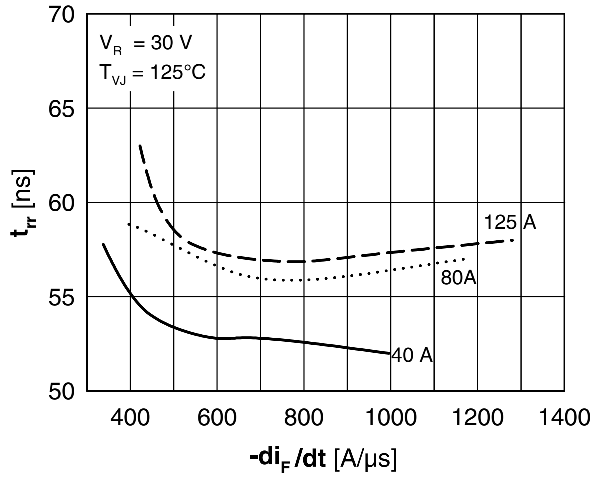

Fig. 13 Reverse recovery time t_{rr} of the body diode vs. di/dt

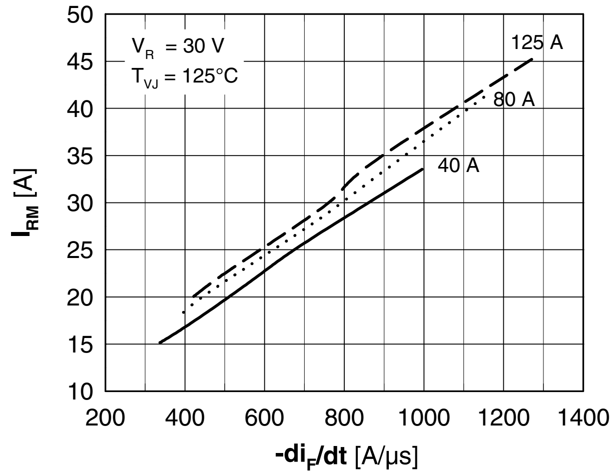

Fig. 14 Reverse recovery current I_{RM} of the body diode vs. di/dt

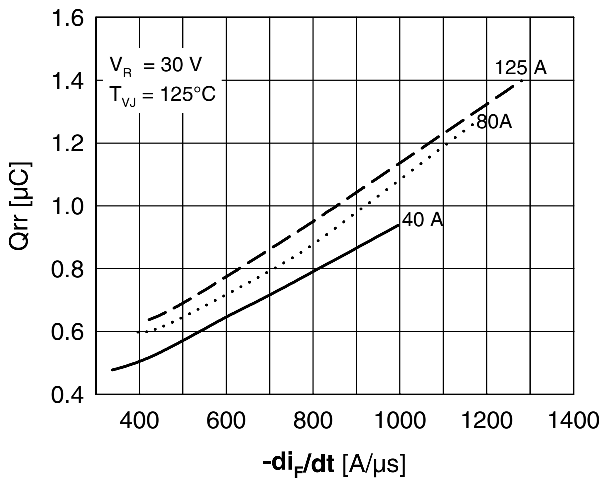

Fig. 15 Reverse recovery charge Q_{rr} of the body diode vs. di/dt

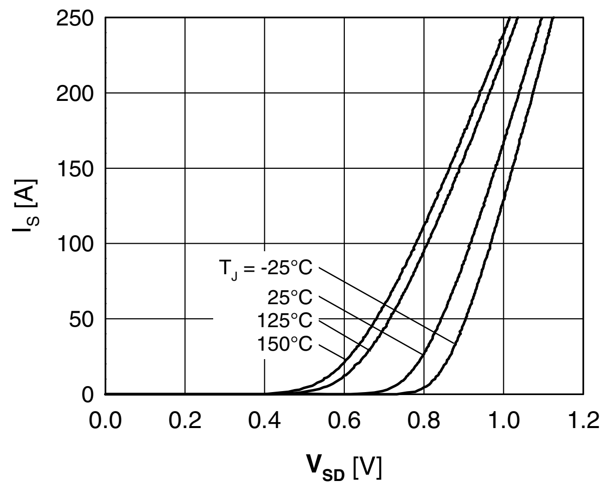

Fig. 16 Source current I_S vs. source drain voltage V_{SD} (body diode)

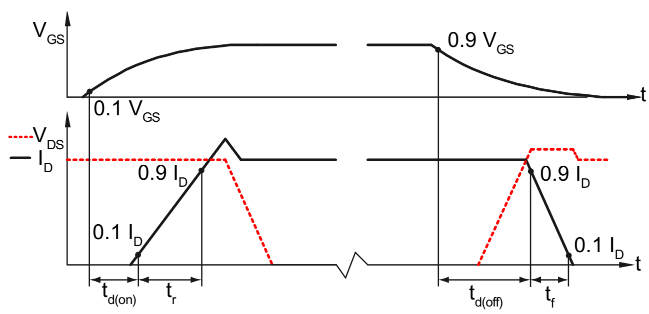

Fig. 17 Definition of switching times

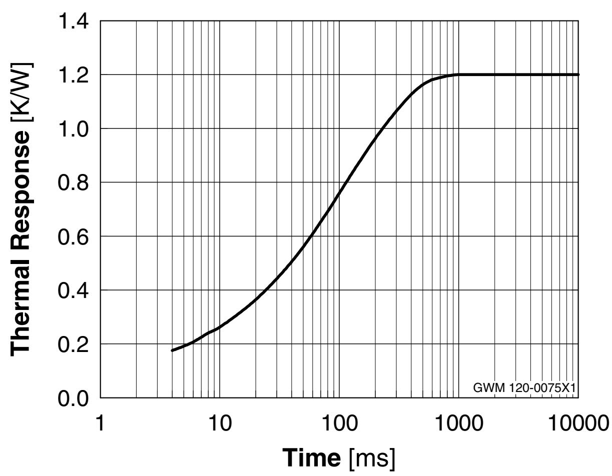

Fig. 18 Typ. therm. impedance junction to heatsink Z_{thJC}

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