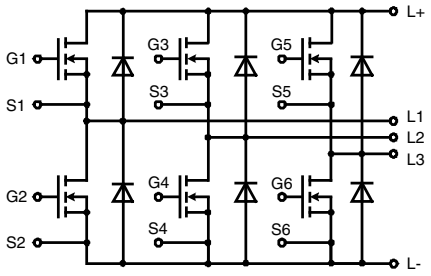
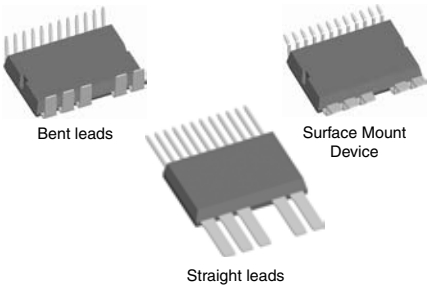
Three phase full Bridge

with Trench MOSFETs
in DCB isolated high current package

V_{DSS} = 40 V
I_{D25} = 180 A
$R_{DSon\ typ.}$ = 2.0 mΩ

Preliminary data





MOSFETs

Symbol	Conditions	Maximum Ratings	
V_{DSS}	T_{VJ} = 25°C to 150°C	40	V
V_{GS}		± 20	V
I_{D25}	T_C = 25°C	180	A
I_{D90}	T_C = 90°C	138	A
I_{F25}	T_C = 25°C (diode)	115	A
I_{F90}	T_C = 90°C (diode)	75	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	T_{VJ} = 25°C		2.0	2.6	mΩ
		T_{VJ} = 125°C		3.2		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} = 14 V; I_D = 25 A			94		nC
Q_{gs}				18		nC
Q_{gd}				29		nC
$t_{d(on)}$	V_{GS} = 10 V; V_{DS} = 30 V; I_D = 25 A; R_G = 10 Ω; inductive load			40		ns
t_r				85		ns
$t_{d(off)}$				140		ns
t_f				90		ns
E_{on}				tbd		mJ
E_{off}				tbd		mJ
E_{recoff}				tbd		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

- 3 lead forms available
  - straight leads (SL)
  - SMD lead version (SMD)
  - bent leads (BL)

Source-Drain Diode

Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{SD}	(diode) I_F = 110 A; V_{GS} = 0 V		1.0	1.6	V
t_{rr}	I_F = 20 A; -di_F/dt = 100 A/µs; V_R = 20 V		70		ns
Q_{RM}			tbd		µC
I_{RM}			tbd		A

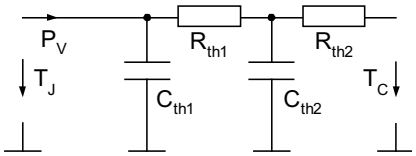
Component

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}	$I_{ISOL} \leq$ 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

Equivalent Circuits for Simulation

Thermal Response

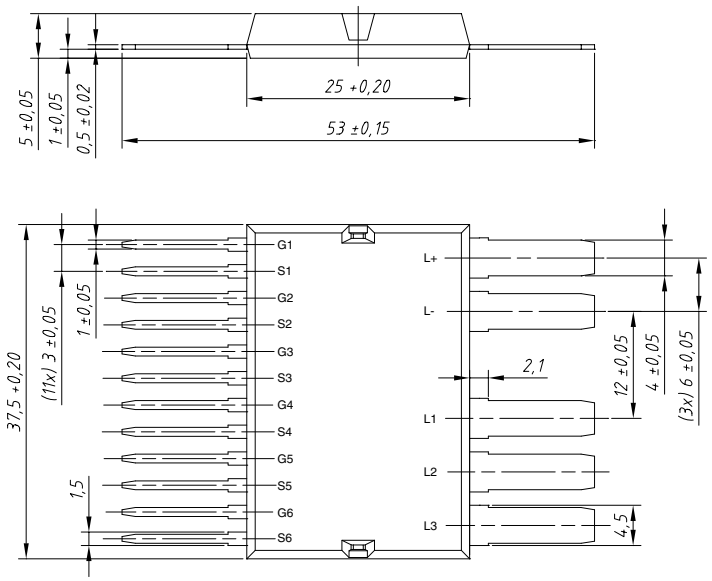


junction - case (typ.)

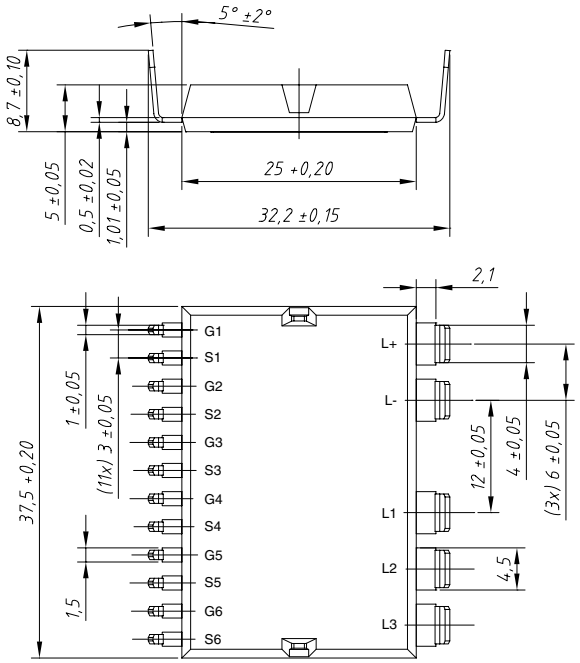
C_{th1} = tbd J/K; R_{th1} = tbd K/W

C_{th2} = tbd J/K; R_{th2} = tbd K/W

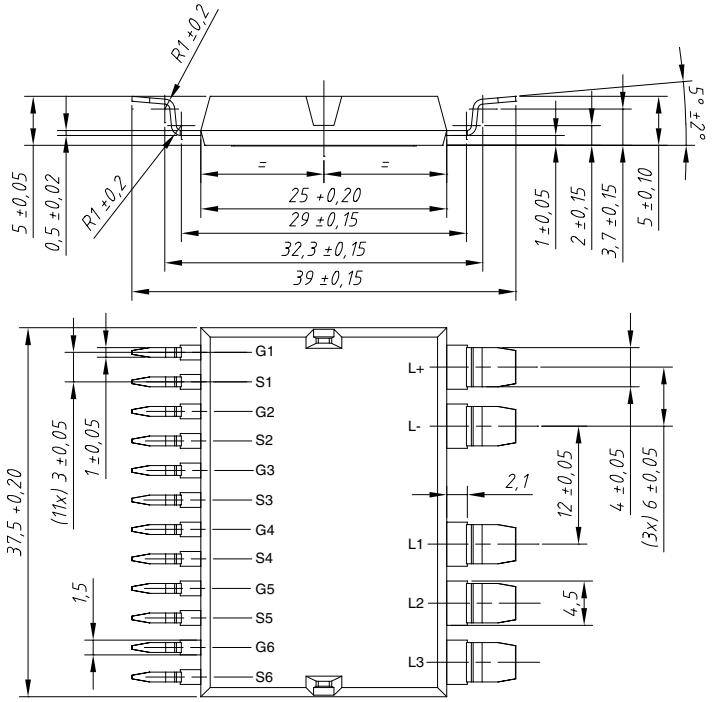
Straight Leads GWM 220-003P3-SL



Bent Leads GWM 220-003P3-BL



Surface Mount Device GWM 220-003P3-SMD



Leads	Ordering	Part Name & Packing Unit Marking	Part Marking	Delivering Mode	Base Qty.	Ordering Code
Straight	Standard	GWM 220-004P3 - SL	GWM 220-004P3	Blister	36	503 169
SMD	Standard	GWM 220-004P3 - SMD	GWM 220-004P3	Blister	36	503 176
Bent	Standard	GWM 220-004P3 - BL	GWM 220-004P3	Blister	36	contact factory