

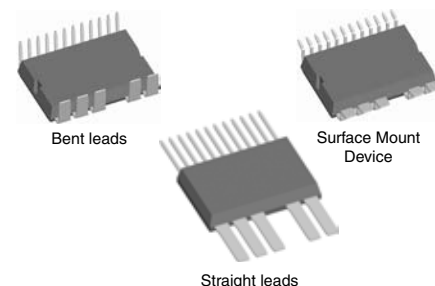
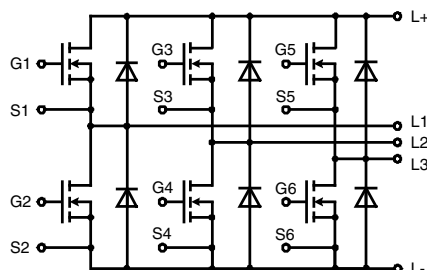
Three phase full Bridge with Trench MOSFETs in DCB isolated high current package

$$V_{DSS} = 40 \text{ V}$$

$$I_{D25} = 180 \text{ A}$$

$$R_{DSon \text{ typ.}} = 2.0 \text{ m}\Omega$$

Preliminary data



MOSFETs			
Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	40	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^{\circ}\text{C}$	180	A
I_{D90}	$T_C = 90^{\circ}\text{C}$	138	A
I_{F25}	$T_C = 25^{\circ}\text{C (diode)}$	115	A
I_{F90}	$T_C = 90^{\circ}\text{C (diode)}$	75	A

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 R_{DSon}
 - 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)

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
R_{DSon}	on chip level at $V_{GS} = 10 \text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.0 3.2	2.6 m Ω
$V_{GS(th)}$	$V_{DS} = 20 \text{ V}; I_D = 1 \text{ mA}$	2		4	V
I_{DSS}	$V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.1	1 μA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			0.2	μA
Q_g Q_{gs} Q_{gd}	$V_{GS} = 10 \text{ V}; V_{DS} = 14 \text{ V}; I_D = 25 \text{ A}$		94 18 29		nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10 \text{ V}; V_{DS} = 30 \text{ V}$ $I_D = 25 \text{ A}; R_G = 10 \Omega$ inductive load		40 85 140 90		ns ns ns ns
E_{on} E_{off} E_{recoff}			tbd tbd tbd		mJ mJ mJ
R_{thJC} R_{thJH}	with heat transfer paste (IXYS test setup)		1.3	1.0 1.6	K/W K/W

Source-Drain Diode

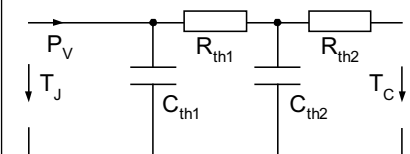
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_{SD}	(diode) $I_F = 110\text{ A}$; $V_{GS} = 0\text{ V}$		1.0	1.6	V
t_{rr}	$I_F = 20\text{ A}$; $-di_F/dt = 100\text{ A}/\mu\text{s}$; $V_R = 20\text{ V}$		70		ns
Q_{RM}			tbd		μC
I_{RM}			tbd		A

($T_J = 25^\circ\text{C}$, unless otherwise specified)

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	$^\circ\text{C}$
T_{stg}		-55...+125	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}$, 50/60 Hz, $f = 1\text{ minute}$	1000	V~
F_C	mounting force with clip	50 - 250	N

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

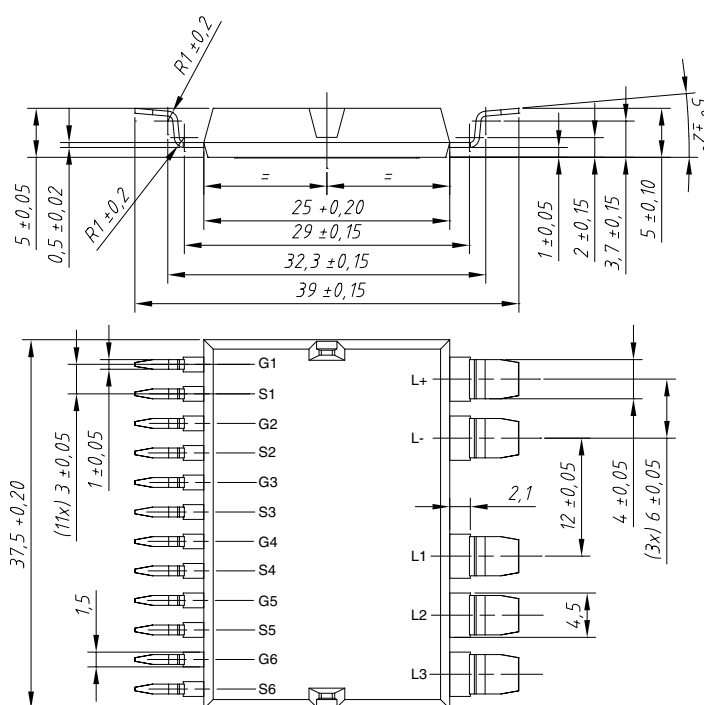
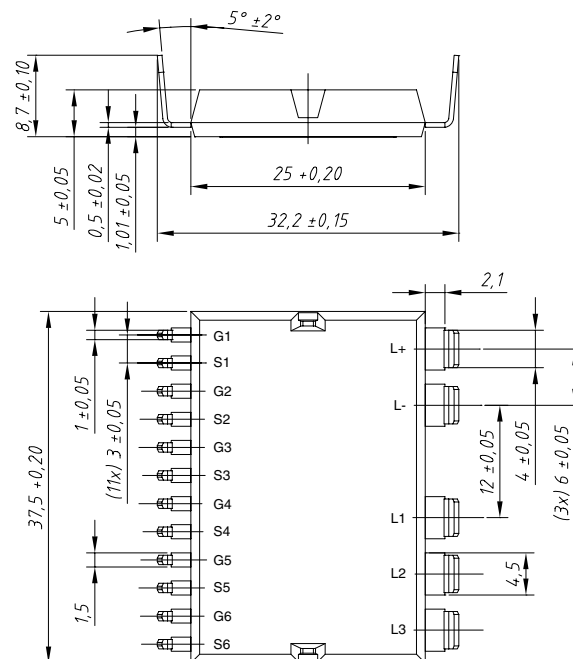
Equivalent Circuits for Simulation
Thermal Response


junction - case (typ.)

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

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

Bent Leads GWM 220-003P3-BL



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