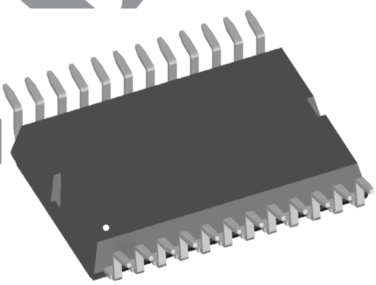
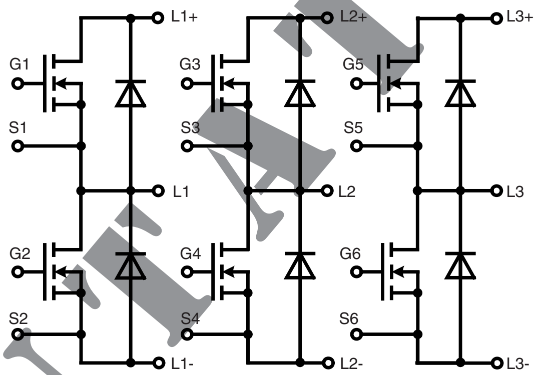
Three phase full Bridge

with Trench MOSFETs
in DCB-isolated high-current package

V_{DSS} = 55 V
I_{D25} = 150 A
$R_{DSon\ typ.}$ = 2.2 mΩ

Part number
MTC120WX55GD





Features / Advantages:

- MOSFETs in trench technology:
  - low R_{DSon}
  - optimized intrinsic reverse diode
- Package:
  - high level of integration
  - high current capability
  - aux. terminals for MOSFET control
  - terminals for soldering or welding connections
  - isolated DCB ceramic base plate with optimized heat transfer
- Space and weight savings

Applications:

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

Package: ISOPLUS-DIL®

- High level of integration
- RoHS compliant
- High current capability
- Aux. Terminals for MOSFET control
- Terminals for soldering or welding connections
- Space and weight savings

MOSFETs

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
V_{DSS}	*drain source breakdown voltage*		T_{VJ} = 25°C to 150°C			55	V
V_{GS}	*gate source voltage*					±15	V
V_{GSM}	*max. transient gate source voltage*					±20	V
I_{D25}	*continuous drain current*		T_C = 25°C			150	A
I_{D80}			T_C = 80°C			120	A
I_{D100}			T_C = 100°C			106	A
$R_{DS(on)}$ 1)	*static drain source on resistance*	on chip level at	T_{VJ} = 25°C		2.2	3.1	mΩ
		I_D = 100 A; V_{GS} = 10 V	T_{VJ} = 125°C		3.7	5.3	mΩ
$V_{GS(th)}$	*gate threshold voltage*	I_D = 1 mA; $V_{DS} = V_{GS}$	T_{VJ} = 25°C	3.0		4.0	V
I_{DSS}	*drain source leakage current*	$V_{DS} = V_{DSS}$; V_{GS} = 0 V	T_{VJ} = 25°C			1	µA
			T_{VJ} = 125°C		50		µA
I_{GSS}	*gate source leakage current*	V_{GS} = ±20 V; V_{DS} = 0 V				500	nA
R_G	*gate resistance*	on chip level					Ω
C_{iss}	*input capacitance*	V_{GS} = 0 V; V_{DS} = 25 V; f = 1 Mhz			6.97		nF
C_{oss}	*output capacitance*				1.03		nF
C_{rss}	*reverse transfer capacitance*				230		pF
Q_g	*total gate charge*	V_{GS} = 10 V; V_{DS} = 28 V; I_D = 100 A			100		nC
Q_{gs}	*gate source charge*				35		nC
Q_{gd}	*gate drain (Miller) charge*				25		nC
$t_{d(on)}$	*turn-on delay time*	inductive load	T_{VJ} = 125°C		100		ns
t_r	*current rise time*	V_{GS} = 10 V; V_{DS} = 24 V			110		ns
$t_{d(off)}$	*turn-off delay time*	I_D = 100 A; R_G = 39 Ω			500		ns
t_f	*current fall time*				100		ns
E_{on}	*turn-on energy per pulse*				0.12		mJ
E_{off}	*turn-off energy per pulse*				0.53		mJ
$E_{rec(off)}$	*turn-off reverse recovery losses*				0.01		mJ
R_{thJC}	*thermal resistance junction to case*					1.0	K/W
R_{thJH}	*thermal resistance junction to heatsink*	with heat transfer paste (IXYS test setup)			1.3		K/W

1) $V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{Pin\ to\ Chip})$

Source-Drain Diode

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
I_{F25}	*forward current*	V_{GS} = 0 V	T_C = 25°C			140	A
I_{F80}			T_C = 80°C			95	A
I_{F100}			T_C = 100°C			80	A
V_{SD}	*source drain voltage*	I_F = 100 A; V_{GS} = 0 V	T_{VJ} = 25°C		0.9	1.2	V
Q_{RM}	*reverse recovery charge*	V_R = 24 V; I_F = 100 A	T_{VJ} = 125°C		0.45		µC
I_{RM}	*max. reverse recovery current*	di/dt = 800 A/µs			22		A
t_{rr}	*reverse recovery time*				38		ns

IXYS reserves the right to change limits, test conditions and dimensions.

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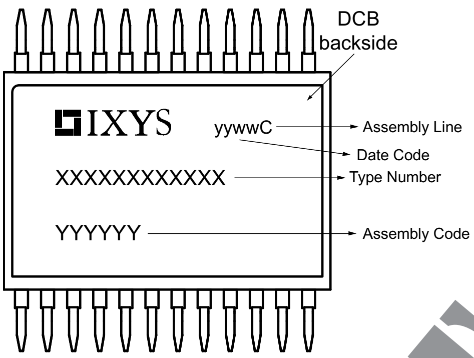
Package ISOPLUS-DIL®				Ratings		
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per pin in main current paths (L1+...L3+, L1-...L3-, L1...L3) may be additionally limited by external connections (PCB tracks) 2 pins for output L1, L2, L3			75	A
T_{stg}	*storage temperature*		-55		125	°C
T_{VJM}	*virtual junction temperature*		-55		175	°C
Weight				25		g
F_C	*mounting force with clip*		50		250	N
V_{ISOL}	*isolation voltage*	t = 1 second; 50/60 Hz, RMS, $I_{ISOL} \leq 1$ mA	1200			V
		t = 1 minute; 50/60 Hz, RMS, $I_{ISOL} \leq 1$ mA	1000			V
$R_{pin\text{-}chip}$	*resistance terminal to chip*	$V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{pin\ to\ chip})$		0.5		mΩ
C_P	*coupling capacity*	between shorted pins and back side metallization		160		pF



Part number

- M = MOSFET
- T = Trench
- C = Trench 2nd Generation
- 120 = Current Rating [A]
- WX = 6-Pack with separated Phase Legs
- 55 = Reverse Voltage [V]
- GD = ISOPLUS-DIL

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MTC120WX55GD-SMD	MTC120WX55GD	Tube	13	517108