

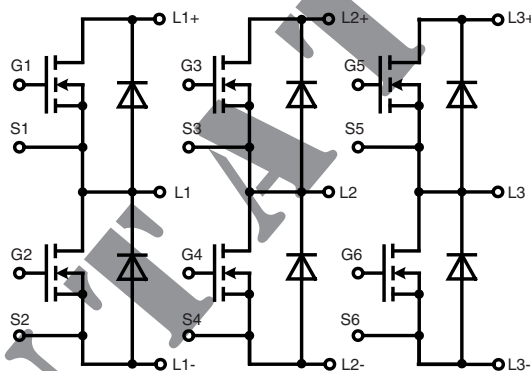
Three phase full Bridge with Trench MOSFETs in DCB-isolated high-current package

$$V_{DSS} = 55 V$$

$$I_{D25} = 150 A$$

$$R_{DSon\ typ.} = 2.2 m\Omega$$

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

Terms & Conditions of usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office. Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

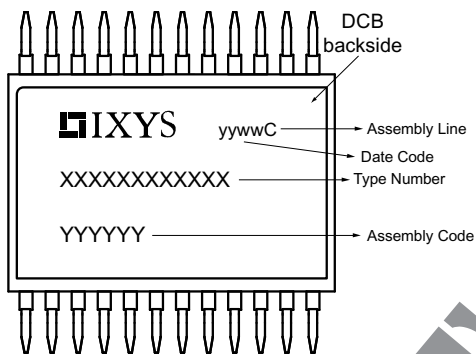
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

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

20170529

MOSFETs				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	Unit
V_{DSS}	drain source breakdown voltage	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$			55	V
V_{GS}	gate source voltage				± 15	V
V_{GSM}	max. transient gate source voltage				± 20	V
I_{D25}	continuous drain current	$T_C = 25^{\circ}\text{C}$			150	A
I_{D80}		$T_C = 80^{\circ}\text{C}$			120	A
I_{D100}		$T_C = 100^{\circ}\text{C}$			106	A
$R_{DS(on)}^{1)}$	static drain source on resistance	on chip level at $I_D = 100\text{ A}; V_{GS} = 10\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.2 3.7	3.1 5.3	$\text{m}\Omega$ $\text{m}\Omega$
$V_{GS(th)}$	gate threshold voltage	$I_D = 1\text{ mA}; V_{DS} = V_{GS}$	$T_{VJ} = 25^{\circ}\text{C}$	3.0	4.0	V
I_{DSS}	drain source leakage current	$V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	50	1	μA μA
I_{GSS}	gate source leakage current	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			500	nA
R_G	gate resistance	on chip level				Ω
C_{iss}	input capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}; f = 1\text{ Mhz}$		6.97		nF
C_{oss}	output capacitance			1.03		nF
C_{rss}	reverse transfer capacitance			230		pF
Q_g	total gate charge	$V_{GS} = 10\text{ V}; V_{DS} = 28\text{ V}; I_D = 100\text{ A}$		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 $V_{GS} = 10\text{ V}; V_{DS} = 24\text{ V}$ $I_D = 100\text{ A}; R_G = 39\ \Omega$	$T_{VJ} = 125^{\circ}\text{C}$	100		ns
t_r	current rise time			110		ns
$t_{d(off)}$	turn-off delay time			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						
I_{F25}	forward current	$V_{GS} = 0\text{ V}$	$T_C = 25^{\circ}\text{C}$		140	A
I_{F80}			$T_C = 80^{\circ}\text{C}$		95	A
I_{F100}			$T_C = 100^{\circ}\text{C}$		80	A
V_{SD}	source drain voltage	$I_F = 100\text{ A}; V_{GS} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$	0.9	1.2	V
Q_{RM}	reverse recovery charge	$V_R = 24\text{ V}; I_F = 100\text{ A}$ $di/dt = 800\text{ A}/\mu\text{s}$	$T_{VJ} = 125^{\circ}\text{C}$	0.45		μC
I_{RM}	max. reverse recovery current			22		A
t_{rr}	reverse recovery time			38		ns

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				
$R_{pin-chip}$	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