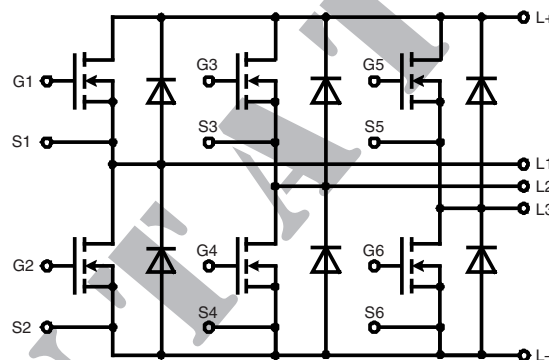
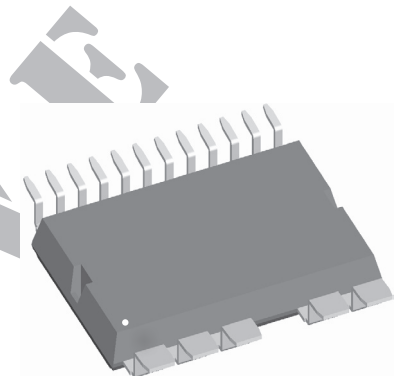


**Three phase full Bridge**  
with Trench MOSFETs  
in DCB-isolated high-current package

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

**Part number**  
MTC120W55GC



**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.

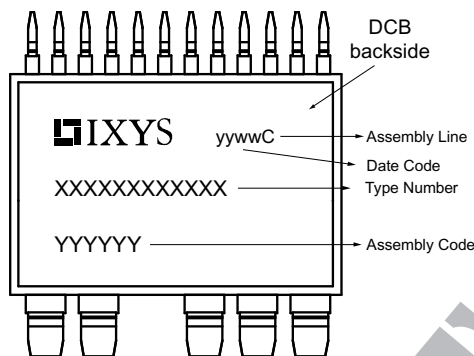
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- 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.

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				$\pm 15$	V
$V_{GSM}$	max. transient gate source voltage				$\pm 20$	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	$\mu\text{A}$ $\mu\text{A}$
$I_{GSS}$	gate source leakage current	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			500	nA
$R_G$	gate resistance	on chip level				$\Omega$
$C_{iss}$	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
<sup>1)</sup> $V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{Pin\ to\ Chip})$						
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		$\mu\text{C}$
$I_{RM}$	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 (P+, N-, L1, L2, L3) may be additionally limited by external connections (PCB tracks)			300	A
$T_{stg}$	storage temperature		-55		125	°C
$T_{VJM}$	virtual junction temperature		-55		175	°C
<b>Weight</b>				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		1000		V
$R_{pin-chip}$	resistance terminal to chip	$V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{pin\ to\ chip})$		0.6		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]  
 W = 6-Pack  
 55 = Reverse Voltage [V]  
 GC = ISOPLUS-DIL

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MTC120W55GC-SMD	MTC120W55GC	Tube	13	517101

## Outlines ISOPLUS-DIL®

