

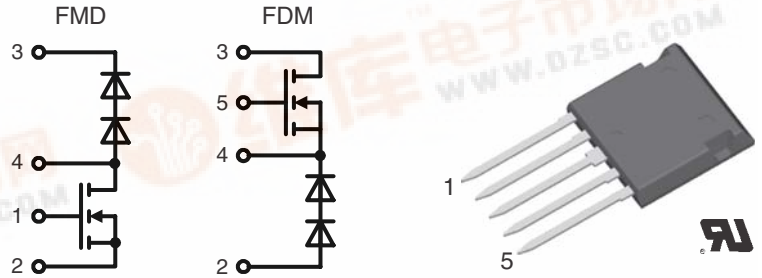


**FMD 21-05QC**  
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**Q-Class Power MOSFETs**  
Chopper Topologies in ISOPLUS i4-PAC™

**$I_{D25}$  = 21 A**  
 **$V_{DSS}$  = 500 V**  
 **$R_{DSon\ typ.}$  = 190 mΩ**

Preliminary data



MOSFET		
Symbol	Conditions	Maximum Ratings
$V_{DSS}$	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	500 V
$V_{GS}$		$\pm 20$ V
$I_{D25}$	$T_C = 25^{\circ}\text{C}$	21 A
$I_{D90}$	$T_C = 90^{\circ}\text{C}$	15 A

**Features**

- Q-Class Power MOSFET technology
  - low  $R_{DSon}$
  - low gate charge for high frequency operation
  - unclamped inductive switching (UIS) capability
  - dv/dt ruggedness
- HiPerDyn™ FRED
  - consisting of series connected diodes
  - enhanced dynamic behaviour for high frequency operation
- ISOPLUS i4-PAC™ package
  - isolated back surface
  - UL registered E72873
  - low coupling capacity between pins and heatsink
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability
  - industry standard outline

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$R_{DSon}$	$V_{GS} = 10\text{ V}; I_D = I_{D90}$			220 mΩ
$V_{GSth}$	$V_{DS} = 20\text{ V}; I_D = 0.25\text{ mA}$	2.5		4.5 V
$I_{DSS}$	$V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		250	250 μA μA
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			200 nA
$Q_g$ $Q_{gs}$ $Q_{gd}$	$V_{GS} = 10\text{ V}; V_{DS} = 0.5 \cdot V_{DSS}; I_D = 14\text{ A}$		95	nC
			20	nC
			42	nC
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	$V_{GS} = 10\text{ V}; V_{DS} = 0.5 \cdot V_{DSS}$ $I_D = 14\text{ A}; R_G = 2\ \Omega$		20	ns
			20	ns
			50	ns
			15	ns
$R_{thJC}$ $R_{thJH}$	with heat transfer paste		0.93	0.5 K/W K/W

**Applications**

- chopper for power factor correction
- supply of high frequency transformer
  - switched mode power supplies
  - welding converters

**Free Wheeling Diode (data for series connection)**

Symbol	Conditions	Maximum Ratings	
$V_{RRM}$	$T_{VJ} = 25^{\circ}\text{C}$ to $150^{\circ}\text{C}$	600	V
$I_{F25}$	$T_C = 25^{\circ}\text{C}$	60	A
$I_{F90}$	$T_C = 90^{\circ}\text{C}$	40	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 15\text{ A}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.5	2.8	V
		1.9		V
$I_R$	$V_R = V_{RRM}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	0.13	0.13	mA mA
$I_{RM}$ $t_{rr}$	$I_F = 30\text{ A}; di_F/dt = -500\text{ A}/\mu\text{s}; T_{VJ} = 125^{\circ}\text{C}$ $V_R = 300\text{ V}$	9		A
		40		ns
$R_{thJC}$ $R_{thJH}$	with heat transfer paste	1.3	0.65	K/W K/W

**Component**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-55...+150	$^{\circ}\text{C}$
$T_{stg}$		-55...+125	$^{\circ}\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500	V~
$F_C$	mounting force with clip	20...120	N

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$C_p$	coupling capacity between shorted pins and mounting tab in the case		40	pF
$d_{S1}, d_A$	pin - pin	1.7		mm
$d_{S2}, d_A$	pin - backside metal	5.5		mm
Weight		9		g

**Dimensions in mm (1 mm = 0.0394")**
