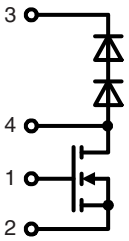
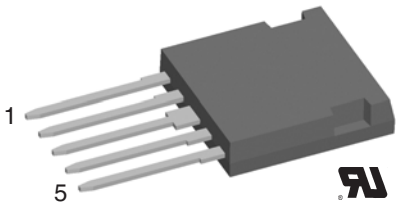
Q-Class Power MOSFETs

Chopper Topologies in ISOPLUS i4-PAC™

Preliminary data

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





MOSFET

Symbol	Conditions	Maximum Ratings	
V_{DSS}	T_{VJ} = 25°C to 150°C	500	V
V_{GS}		±20	V
I_{D25}	T_C = 25°C	21	A
I_{D90}	T_C = 90°C	15	A

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

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

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°C to 150°C	600	V
I_{F25}	T_C = 25°C	60	A
I_{F90}	T_C = 90°C	40	A

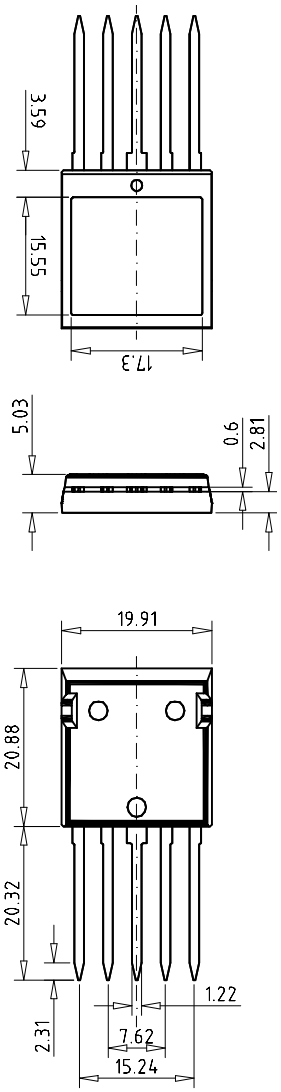
Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 15 A; T_{VJ} = 25°C		2.5	2.8	V
	T_{VJ} = 125°C		1.9		V
I_R	$V_R = V_{RRM}$; T_{VJ} = 25°C			0.13	mA
	T_{VJ} = 125°C		0.13		mA
I_{RM}	I_F = 30 A; di_F/dt = -500 A/µs; T_{VJ} = 125°C		9		A
t_{rr}	V_R = 300 V		40		ns
R_{thJC}				0.65	K/W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

Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-55...+150	°C
T_{stg}		-55...+125	°C
V_{ISOL}	$I_{ISOL} \leq$ 1 mA; 50/60 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_S,d_A	pin - pin	1.7			mm
d_S,d_A	pin - backside metal	5.5			mm
Weight			9		g

Dimensions in mm (1 mm = 0.0394")



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