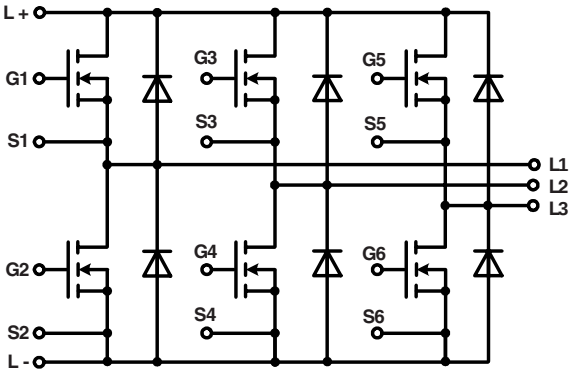
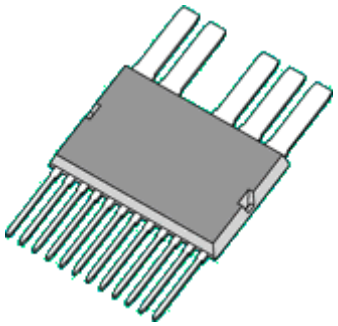
Three phase full bridge

with Trench MOSFETs
in DCB isolated high current package

V_{DSS} = 55 V
I_{D25} = 160 A
$R_{DSon\ typ.}$ = 2.3 mΩ

Preliminary data





MOSFETs

Symbol	Conditions	Maximum Ratings	
V_{DSS}	T_{VJ} = 25°C to 150°C	55	V
V_{GS}		±20	V
I_{D25}	T_C = 25°C	160	A
I_{D90}	T_C = 90°C	120	A
I_{F25}	T_C = 25°C (diode)	135	A
I_{F90}	T_C = 90°C (diode)	90	A

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
R_{DSon}	on chip level at V_{GS} = 10 V; T_{VJ} = 25°C		2.3	2.9	mΩ
	T_{VJ} = 125°C		3.8		mΩ
V_{GSth}	V_{DS} = 20 V; I_D = 1 mA	2		4	V
I_{DSS}	V_{DS} = V_{DSS}; V_{GS} = 0 V; T_{VJ} = 25°C			1	µA
	T_{VJ} = 125°C		0.1		mA
I_{GSS}	V_{GS} = ±20 V; V_{DS} = 0 V			0.2	µA
Q_g	V_{GS}= 10 V; V_{DS} = 44 V; I_D = 25 A		86		nC
Q_{gs}			18		nC
Q_{gd}			25		nC
$t_{d(on)}$	V_{GS}= 10 V; V_{DS} = 30 V;		25		ns
t_r	I_D = 25 A; R_G = 10 Ω		50		ns
$t_{d(off)}$			70		ns
t_f			40		ns
V_F	(diode) I_F = 80 A; V_{GS}= 0 V		0.9	1.4	V
t_{rr}	(diode) I_F = 20 A; -di/dt = 100 A/µs; V_{DS} = 30 V		100		ns
R_{thJC}				0.85	K/W
R_{thJH}	with heat transfer paste		1.7		K/W

Applications

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

Features

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

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

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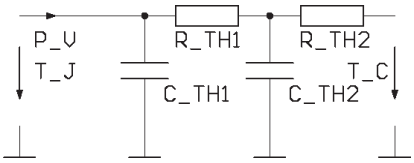
Component

Symbol	Conditions	Maximum Ratings	
I_{RMS}	per pin in main current paths (P+, N-, L_1, L_2, L_3) may be additionally limited by external connections	300	A
T_{VJ}		-40...+175	°C
T_{stg}		-55...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1$ mA; 50/60 Hz; t = 1 min	1000	V~
F_C	Mounting force with clip	50 - 250	N

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.
$R_{pin\ to\ chip}$			0.6	mΩ
C_P	coupling capacity between shorted pins and mounting tab in the case		160	pF
Weight	typ.		25	g

Equivalent Circuits for Simulation

Thermal Response

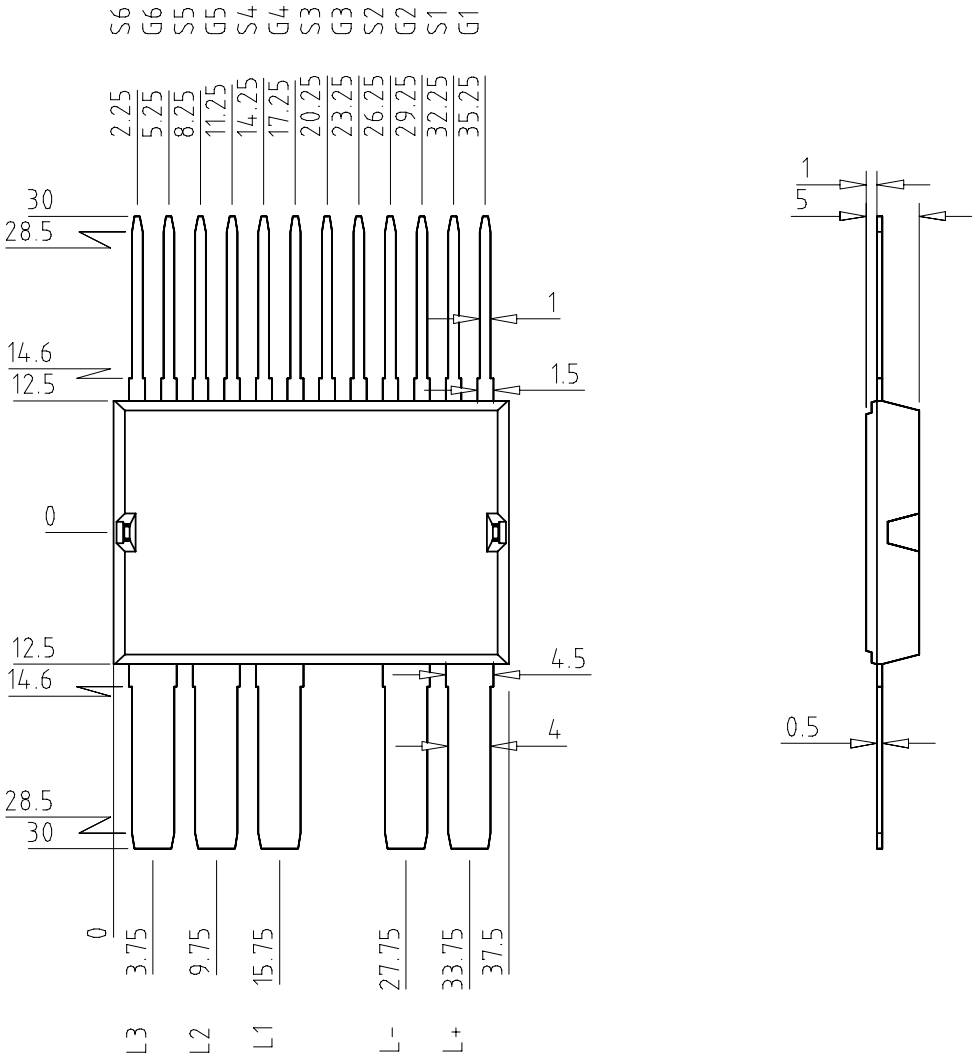


junction - case (typ.)

C_{th1} = 0.039 J/K; R_{th1} = 0.28 K/W

C_{th2} = 0.069 J/K; R_{th2} = 0.57 K/W

Dimensions in mm (1 mm = 0.0394")



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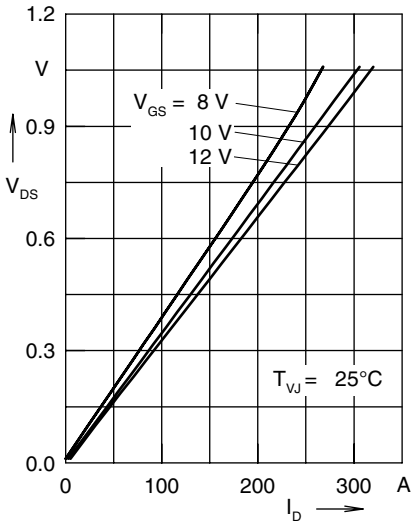

Fig. 1: typ. output characteristics
[$V_{DS} = I_D (R_{DSon} + 2x\ R_{pin\ to\ chip})$]

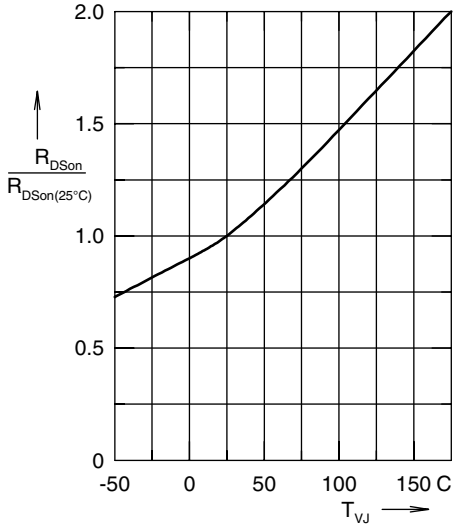

Fig. 2: typ. dependence of R_{DSon} on temperature

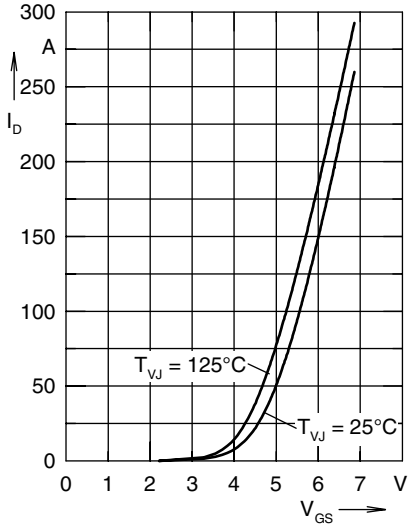

Fig. 3: typ.transfer characteristics

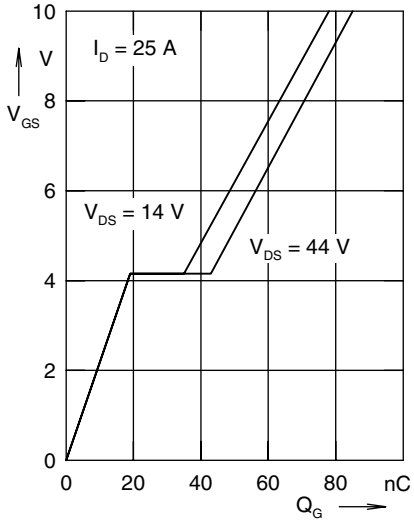

Fig. 4: typ. gate charge characteristics

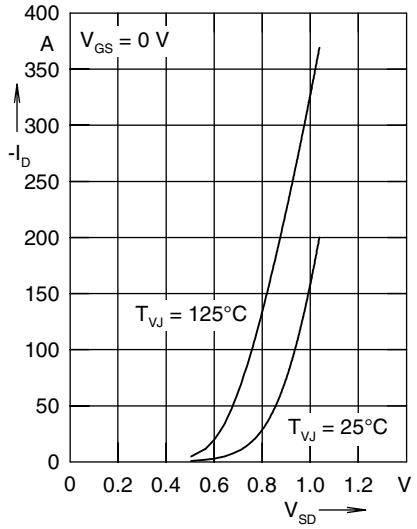

Fig. 5: typ. conduction characteristics of body diode

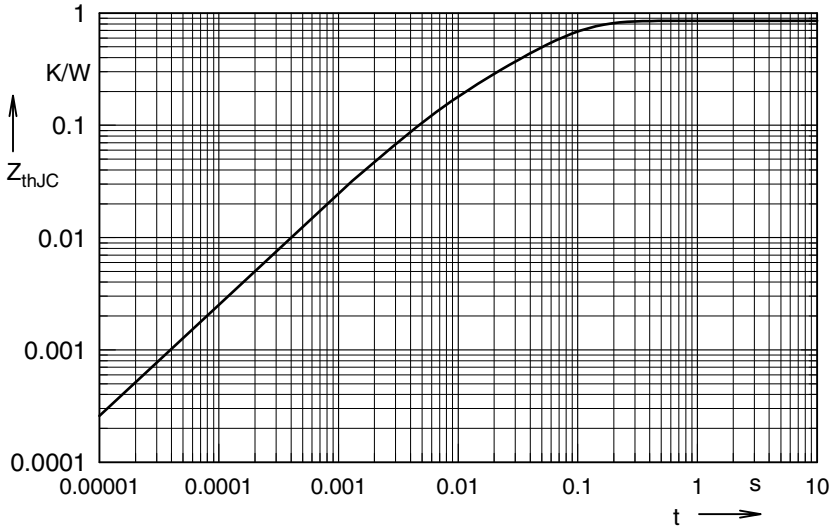

Fig. 6: typ. transient thermal impedance

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