

SiC Power MOSFET

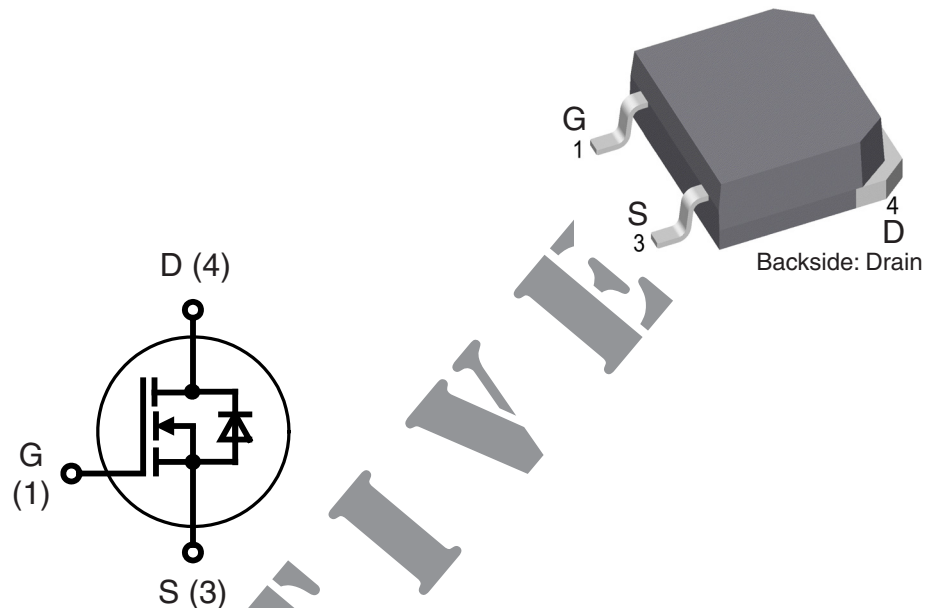
$$I_{D25} = 90 \text{ A}$$

$$V_{DSS} = 1200 \text{ V}$$

$$R_{DS(on) \text{ max}} = 34 \text{ m}\Omega$$

Single MOSFET

Part number
MCB60I1200TZ

**Features / Advantages:**

- High speed switching with low capacitances
- High blocking voltage with low $R_{DS(on)}$
- Easy to parallel and simple to drive
- Avalanche ruggedness
- Resistant to latch-up

Applications:

- Solar inverters
- High voltage DC/DC converters
- Motor drives
- Switch mode power supplies
- UPS
- Battery chargers
- Induction heating

Package: TO-268AA (D3Pak-HV)

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- High creepage distance between terminals

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 the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

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.

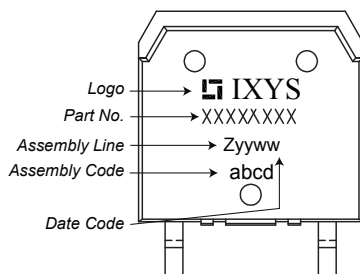
MOSFET				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.		
V_{DS}	drain source breakdown voltage				1200		V
V_{GS}	max transient gate source voltage		-10		+25		V
V_{GS}	continous gate source voltage	recommended operational value	-5		+20		V
I_{D25}	drain current				90		A
I_{D80}					70		A
I_{D100}					60		A
R_{DSon}	static drain source on resistance	$I_D = 50 \text{ A}; V_{GS} = 20 \text{ V}$			25	34	mΩ
					43		mΩ
					52		mΩ
$V_{GS(th)}$	gate threshold voltage	$I_D = 15 \text{ mA}; V_{DS} = 10 \text{ V}$	2.0	2.6	4.0		V
				2.1			V
I_{DSS}	drain source leakage current	$V_{DS} = 1200 \text{ V}; V_{GS} = 0 \text{ V}$		2	100		μA
I_{GSS}	gate source leakage current	$V_{DS} = 0 \text{ V}; V_{GS} = 20 \text{ V}$			0.6		μA
R_G	internal gate resistance				1.1		Ω
C_{iss}	input capacitance	$V_{DS} = 1000 \text{ V}; V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$	2790		pF
C_{oss}	output capacitance				220		pF
C_{rss}	reverse transfer (Miller) capacitance				15		pF
Q_g	total gate charge	$V_{DS} = 800 \text{ V}; I_D = 50 \text{ A}; V_{GS} = -5/20 \text{ V}$		$T_{VJ} = 25^\circ\text{C}$	160		nC
Q_{gs}	gate source charge				46		nC
Q_{gd}	gate drain (Miller) charge				50		nC
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{DS} = 800 \text{ V}; I_D = 50 \text{ A}$ $V_{GS} = -5/20 \text{ V}; R_G = 2 \text{ } \Omega$ (external)		$T_{VJ} = 25^\circ\text{C}$			ns
t_r	current rise time						ns
$t_{d(off)}$	turn-off delay time						ns
t_f	current fall time						ns
E_{on}	turn-on energy per pulse						mJ
E_{off}	turn-off energy per pulse						mJ
$E_{rec(off)}$	reverse recovery losses at turn-off			mJ			
R_{thJC}	thermal resistance junction to case	with heatsink compound; IXYS test setup ¹⁾			0.27		K/W
R_{thJH}	thermal resistance junction to heatsink				0.38		K/W

¹⁾ part is mounted directly on heat sink

Source-Drain Diode				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.		
I_{S25}	continuous source current	$V_{GS} = -5 \text{ V}$					A
I_{S100}							
V_{SD}	forward voltage drop	$I_F = 25 \text{ A}; V_{GS} = -5 \text{ V}$			4.0		V
					3.5		V
t_{rr}	reverse recovery time	$V_{GS} = -5 \text{ V}; I_F = 50 \text{ A}$ $V_R = 800 \text{ V}; -di_F/dt = 1000 \text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$	45		ns
Q_{RM}	reverse recovery charge (intrinsic diode)				410		nC
I_{RM}	max. reverse recovery current				13.5		A

Package TO-268AA (D3Pak-HV)

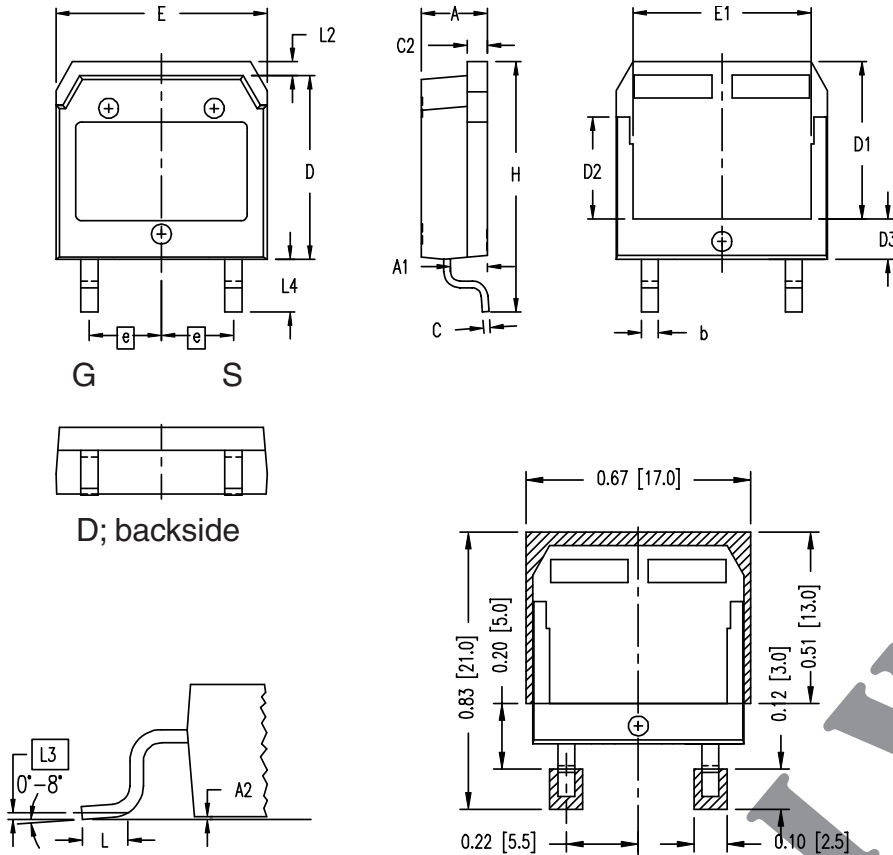
Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per terminal				A
T_{stg}	storage temperature		-40		150	°C
T_{op}	operation temperature		-40		150	°C
T_{vJ}	virtual junction temperature		-40		175	°C
Weight				4		g
F_C	mounting force with clip		20		120	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	9.4			mm
$d_{Spb/Appb}$		terminal to backside	5.6			mm

Product Marking

Part number

M = Mosfet
 C = SiC MOSFET
 B = Generation 2
 60 = Current Rating [A]
 I = Single Mosfet
 1200 = Reverse Voltage [V]
 TZ = TO-268AA (D3Pak) (2HV)

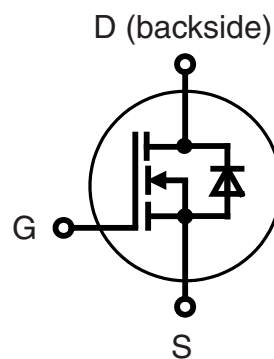
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MCB60I1200TZ	MCB60I1200TZ	Tube	30	515522

Outlines TO-268AA (D3Pak-HV)



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.010
b	1.15	1.45	0.045	0.057
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	11.80	12.10	0.465	0.476
D2	7.50	7.80	0.295	0.307
D3	2.90	3.20	0.114	0.126
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.450 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	1.70	2.00	0.067	0.079
L2	1.00	1.15	0.039	0.045
L3	0.250 BSC		0.010 BSC	
L4	3.80	4.10	0.150	0.161

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