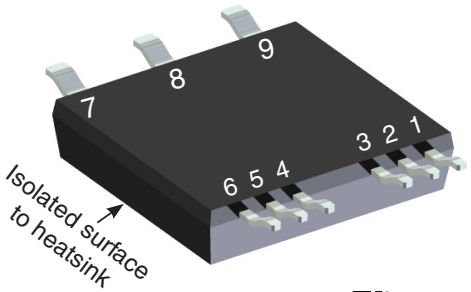
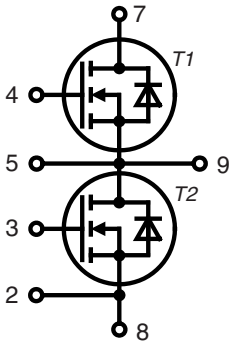
SiC Power MOSFET

I_{D25}	=	38 A
V_{DSS}	=	1200 V
$R_{DS(on)\ max}$	=	52 mΩ

Part number
MCB30P1200LB



E72873



Features / Advantages:
- High speed switching with low capacitances
- High blocking voltage with low $R_{DS(on)}$
- Easy to parallel and simple to drive
- Resistant to latch-up
- Real Kelvin source connection

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

Package: SMPD
- DCB isolated backside
- Isolation Voltage 2500 V
- Epoxy meets UL 94V-0
- RoHS compliant
- Advanced power cycling

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

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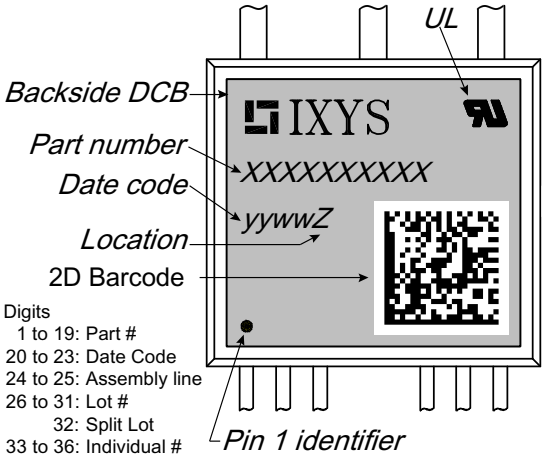
MOSFET				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
$V_{(BR)DSS}$	*drain source breakdown voltage*	I_D = 100 µA		1200			V
$V_{GS(max)}$	*max transient gate source voltage*			-10		+25	V
V_{GS}	*continous gate source voltage*	recommended operational value		-5		+20	V
I_{D25}	*drain current*	V_{GS} = 20 V	T_C = 25°C			38	A
I_{D80}			T_C = 80°C			30	A
I_{D100}			T_C = 100°C			27	A
R_{DSon}	*static drain source on resistance*	I_D = 40 A; V_{GS} = 20 V	T_{VJ} = 25°C		40	52	mΩ
			T_{VJ} = 175°C		90		mΩ
$V_{GS(th)}$	*gate threshold voltage*	I_D = 10 mA; V_{GS} = V_{DS}	T_{VJ} = 25°C	2.0	2.6	4.0	V
			T_{VJ} = 175°C		2.0		V
I_{DSS}	*drain source leakage current*	V_{DS} = 1200 V; V_{GS} = 0 V	T_{VJ} = 25°C		1	100	µA
I_{GSS}	*gate source leakage current*	V_{DS} = 0 V; V_{GS} = 20 V	T_{VJ} = 25°C			250	nA
R_G	*internal gate resistance*	f = 1 MHz, V_{AC} = 25 mV, ESR of C_{ISS}			1.8		Ω
C_{iss}	*input capacitance*	V_{DS} = 1000 V; V_{GS} = 0 V; f = 1 MHz	T_{VJ} = 25°C		1895		pF
C_{oss}	*output capacitance*				150		pF
C_{rss}	*reverse transfer (Miller) capacitance*				10		pF
Q_g	*total gate charge*	V_{DS} = 800 V; I_D = 40 A; V_{GS} = -5/20 V	T_{VJ} = 25°C		115		nC
Q_{gs}	*gate source charge*				28		nC
Q_{gd}	*gate drain (Miller) charge*				37		nC
$t_{d(on)}$	*turn-on delay time*	Inductive switching Free Wheeling Diode: Body Diode @ V_{GS} = -5V V_{DS} = 800 V; I_D = 40 A V_{GS} = -5/20 V; R_G = 15 Ω (external)	T_{VJ} = 25°C		25.5		ns
t_r	*current rise time*				11.1		ns
$t_{d(off)}$	*turn-off delay time*				85		ns
t_f	*current fall time*				23		ns
E_{on}	*turn-on energy per pulse*				0.92		mJ
E_{off}	*turn-off energy per pulse*				0.48		mJ
$t_{d(on)}$	*turn-on delay time*	Inductive switching Free Wheeling Diode: Body Diode @ V_{GS} = -5V V_{DS} = 800 V; I_D = 40 A V_{GS} = -5/20 V; R_G = 15 Ω (external)	T_{VJ} = 150°C		23.5		ns
t_r	*current rise time*				9.8		ns
$t_{d(off)}$	*turn-off delay time*				93		ns
t_f	*current fall time*				25		ns
E_{on}	*turn-on energy per pulse*				1.0		mJ
E_{off}	*turn-off energy per pulse*				0.4		mJ
R_{thJC}	*thermal resistance junction to case*					0.9	K/W
R_{thJH}	*thermal resistance junction to heatsink*	with heatsink compound; IXYS test setup			1.15		K/W

Source-Drain Diode				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
V_{SD}	*forward voltage drop*	I_F = 20 A; V_{GS} = -5 V	T_{VJ} = 25°C		4.1		V
			T_{VJ} = 175°C		3.5		V
t_{rr}	*reverse recovery time*	V_{GS} = -5 V; I_F = 40 A V_R = 800 V; -di$_F$/dt = 1000 A/µs	T_{VJ} = 25°C		55		ns
Q_{RM}	*reverse recovery charge (intrinsic diode)*				285		nC
I_{RM}	*max. reverse recovery current*				15		A

Note:
When using SiC Body Diode the maximum recommended V_{GS} = -5V

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Package SMPD			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	
I_{RMS}	*RMS current*	wide terminal standard terminal			100 60	A A
T_{stg} T_{op} T_{VJ}	*storage temperature* *opertation temperature* *virtual junction temperature*		-55 -55 -55		150 150 175	°C °C °C
Weight				8		g
F_C	*mounting force with clip*		40		130	N
$d_{Spp/App}$ $d_{Spb/Apb}$	*creepage distance on surface / striking distance through air*	terminal to terminal terminal to backside	1.6 4.0			mm mm
V_{ISOL}	*isolation voltage*	t = 1 second t = 1 minute 50/60 Hz; RMS; I_{ISOL} < 1 mA		3000 2500		V V



Part number

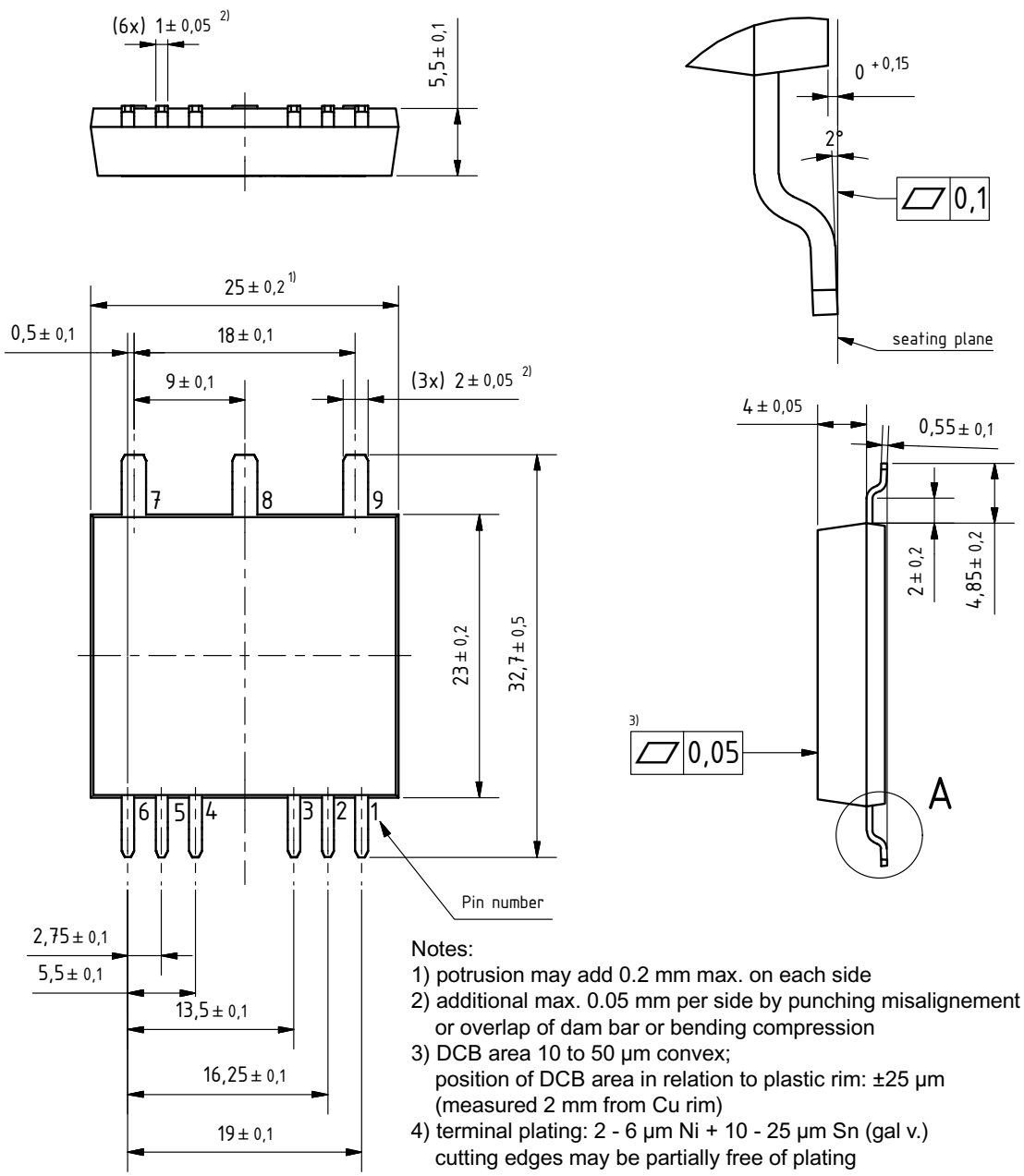
M = Mosfet
C = SiC MOSFET
B = Generation 2
30 = Current Rating [A]
P = Phase leg
1200 = Reverse Voltage [V]
LB = SMPD-B

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MCB30P1200LB-TUB	MCB30P1200LB	Tube	20	MCB30P1200LB-TUB
Alternative	MCB30P1200LB-TRR	MCB30P1200LB	Tape&Reel	200	MCB30P1200LB-TRR

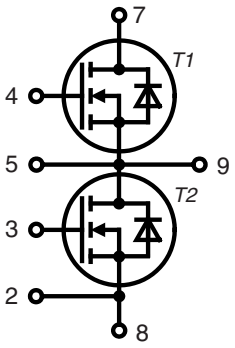
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Outlines SMPD-B

Dimensions in mm (1 mm = 0.0394“)



Notes:
1) potrusion may add 0.2 mm max. on each side
2) additional max. 0.05 mm per side by punching misalignement or overlap of dam bar or bending compression
3) DCB area 10 to 50 µm convex;
position of DCB area in relation to plastic rim: ±25 µm (measured 2 mm from Cu rim)
4) terminal plating: 2 - 6 µm Ni + 10 - 25 µm Sn (gal v.)
cutting edges may be partially free of plating



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Curves

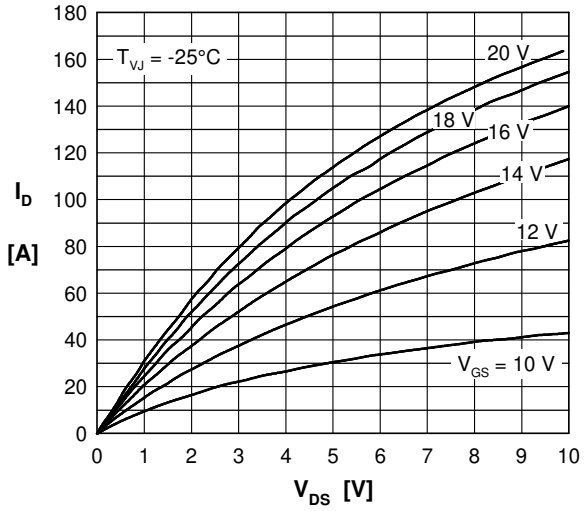


Fig. 1 Typical output characteristics (-25°C)

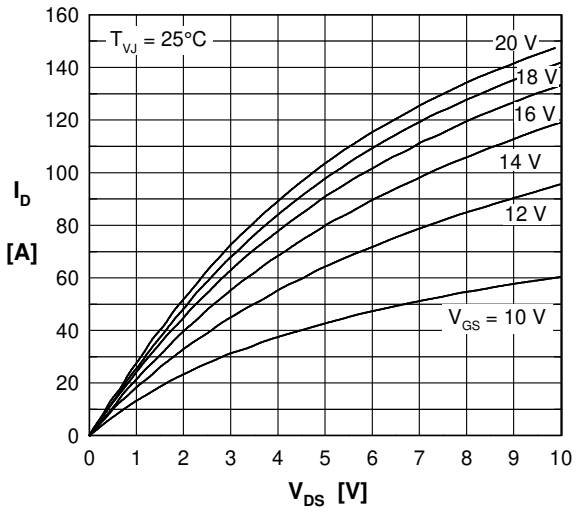


Fig. 2 Typical output characteristics (25°C)

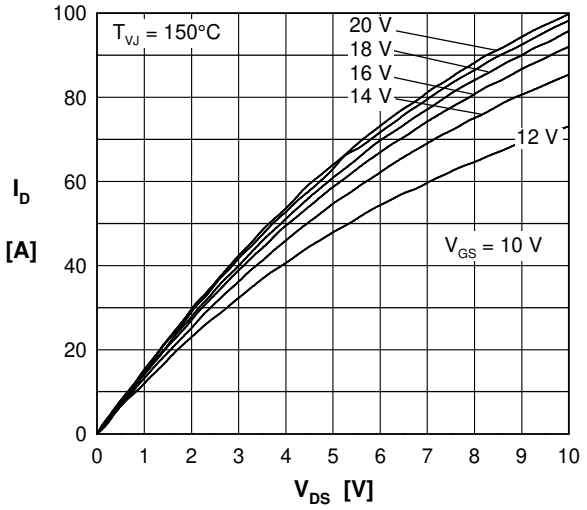


Fig. 3 Typical output characteristics (150°C)

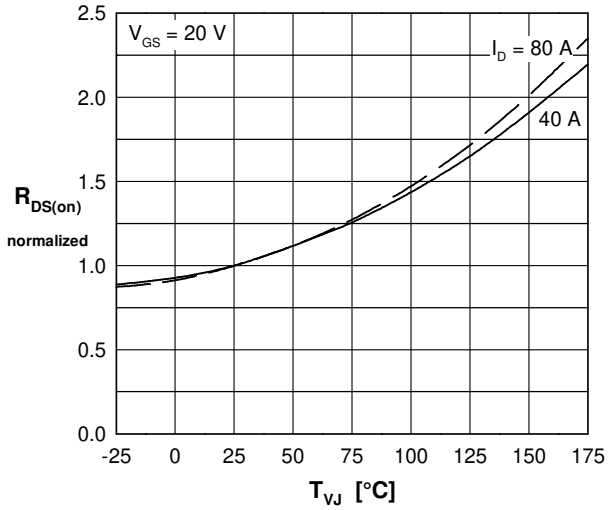


Fig. 4 $R_{DS(on)}$ normalized vs. junction temperature T_{VJ}

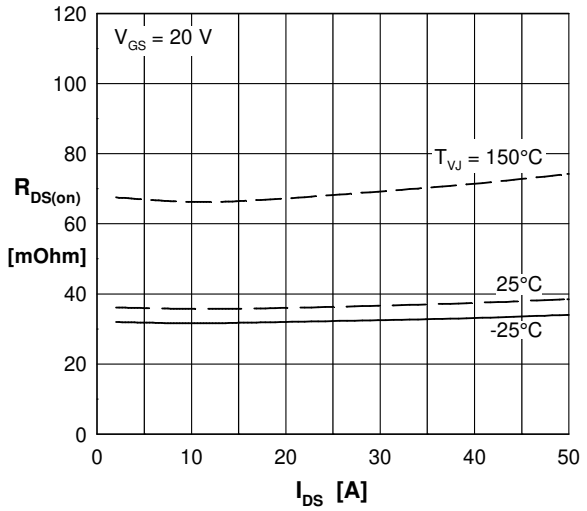


Fig. 5 $R_{DS(on)}$ versus drain current

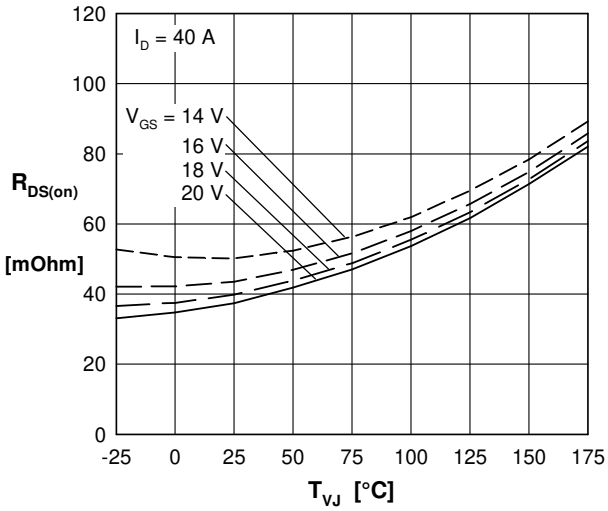


Fig. 6 $R_{DS(on)}$ versus junction temperature T_{VJ}

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Curves

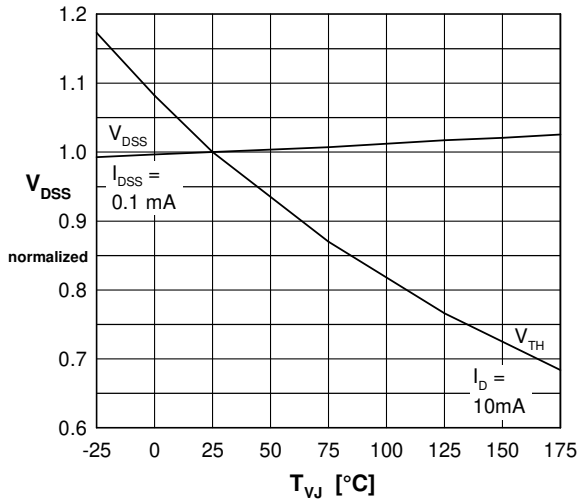


Fig. 7 Norm. breakdow V_{DSS} & treshhold voltage V_{TH} versus junction temperature T_{VJ}

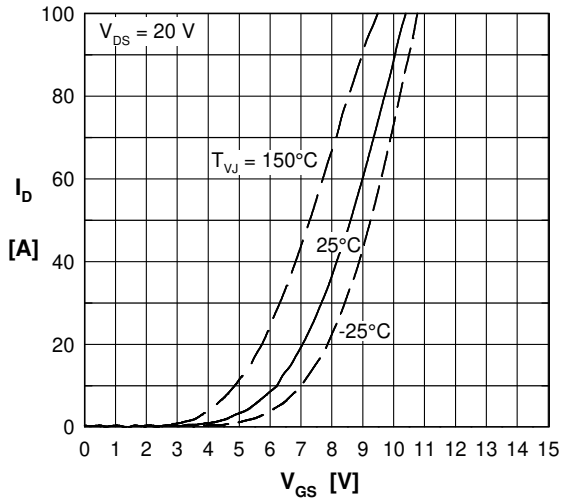


Fig. 8 Typical transfer characteristics

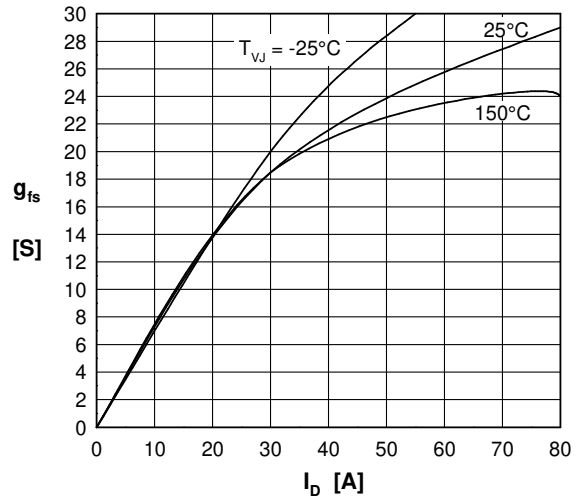


Fig. 9 Typical forward transconductance

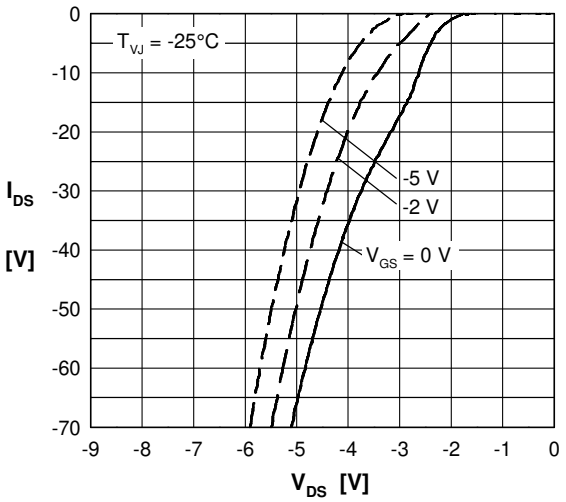


Fig. 10 Forward voltage drop of intrinsic diode versus V_{DS} measured at -55°C

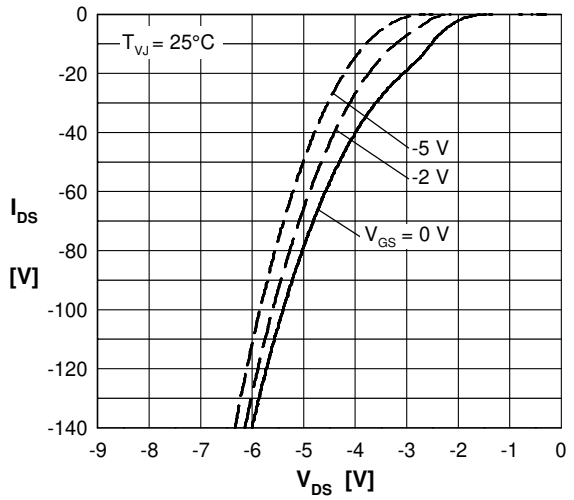


Fig. 11 Forward voltage drop of intrinsic diode versus V_{DS} measured at 25°C

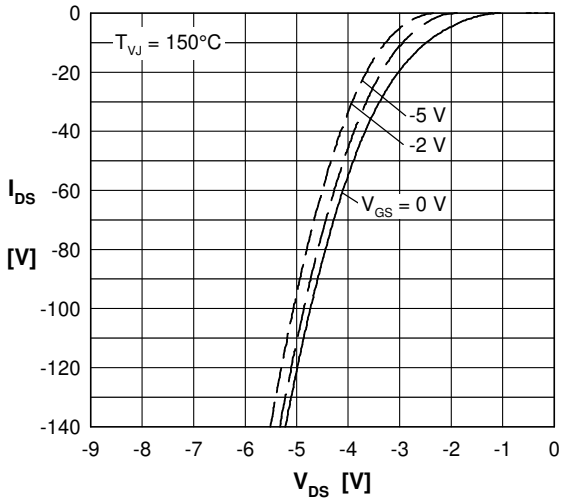


Fig. 12 Forward voltage drop of intrinsic diode versus V_{DS} measured at 150°C

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Curves

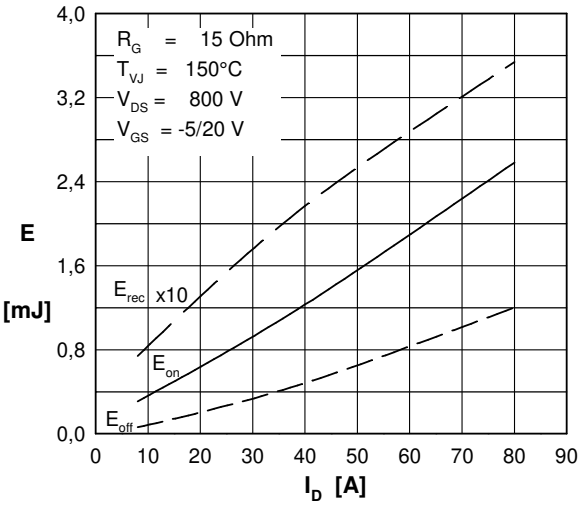


Fig. 13 Typical switching energy versus drain current

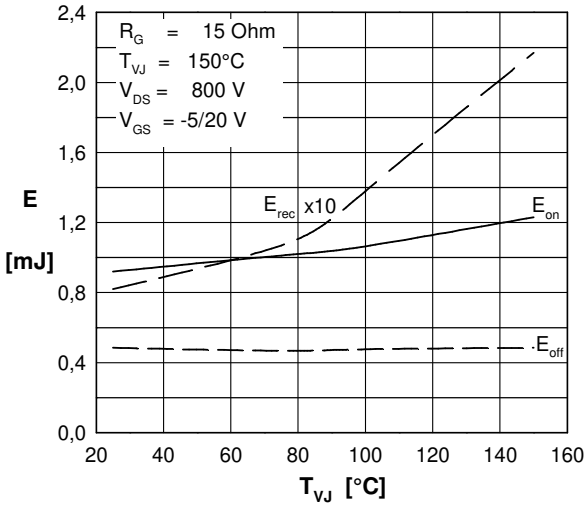


Fig. 14 Typical switching energy versus temperature

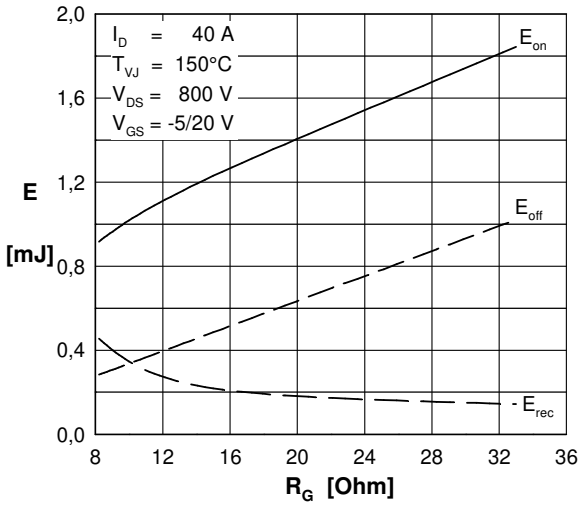


Fig. 15 Typical switching energy versus external gate resistor

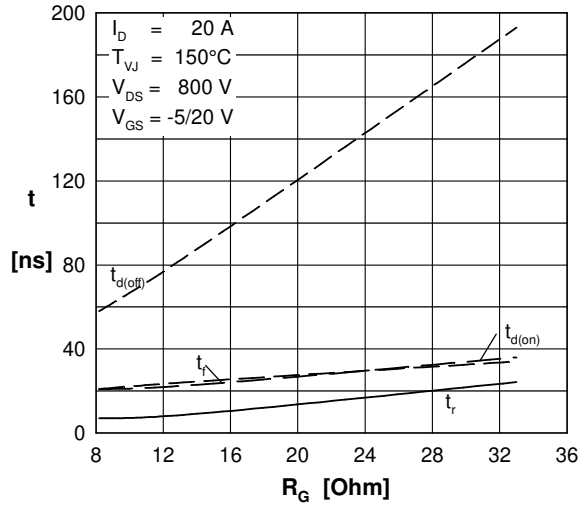


Fig. 16 Typical switching time versus external gate resistor

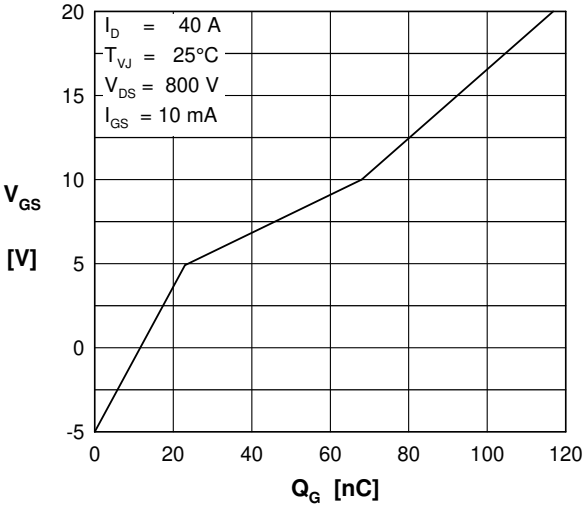


Fig. 17 Typical turn on gate charge, trendline

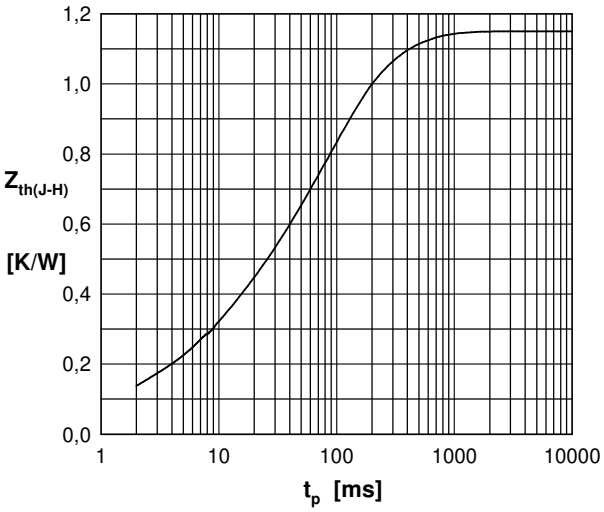


Fig. 18 Typical transient thermal impedance

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