

MOSFET				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.		
V_{DS}	drain source breakdown voltage	$V_{GS} = 0 \text{ V}$, $I_D = 200 \mu\text{A}$	1200				V
V_{GSM}	max transient gate source voltage	recommended operational value	-10		+25		V
V_{GS}	continous gate source voltage		-5		+20		V
I_{D25}	drain current	$V_{GS} = 20 \text{ V}$				47	A
I_{D80}						35	A
I_{D100}						30	A
R_{DSon}	static drain source on resistance	$I_D = 40 \text{ A}$; $V_{GS} = 20 \text{ V}$				40	mΩ
						75	mΩ
$V_{GS(th)}$	gate threshold voltage	$I_D = 10 \text{ mA}$; $V_{GS} = V_{DS}$	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	μA
						20	μA
I_{GSS}	gate source leakage current	$V_{DS} = 0 \text{ V}$; $V_{GS} = 20 \text{ V}$				0.5	μA
R_G	internal gate resistance					4.8	Ω
C_{iss}	input capacitance	$V_{DS} = 1000 \text{ V}$; $V_{GS} = 0 \text{ V}$; $f = 1 \text{ MHz}$				1900	pF
C_{oss}	output capacitance					160	pF
C_{rss}	reverse transfer (Miller) capacitance					13	pF
Q_g	total gate charge	$V_{DS} = 800 \text{ V}$; $I_D = 40 \text{ A}$; $V_{GS} = 0/20 \text{ V}$				100	nC
Q_{gs}	gate source charge					22	nC
Q_{gd}	gate drain (Miller) charge					36	nC
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{DS} = 800 \text{ V}$; $I_D = 40 \text{ A}$ $V_{GS} = -5 / 20 \text{ V}$; $R_G = 10 \Omega$ (external) Freewheeling diode is Mosfet's body diode				23	ns
t_r	current rise time					9	ns
$t_{d(off)}$	turn-off delay time					75	ns
t_f	current fall time					19	ns
E_{on}	turn-on energy per pulse					1.08	mJ
E_{off}	turn-off energy per pulse					0.29	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off					0.04	mJ
$t_{d(on)}$	turn-on delay time					23	ns
t_r	current rise time					9	ns
$t_{d(off)}$	turn-off delay time					100	ns
t_f	current fall time					22	ns
E_{on}	turn-on energy per pulse	Inductive switching $V_{DS} = 800 \text{ V}$; $I_D = 40 \text{ A}$ $V_{GS} = -5 / 20 \text{ V}$; $R_G = 10 \Omega$ (external) Freewheeling diode is Mosfet's body diode				1.48	mJ
E_{off}	turn-off energy per pulse					0.35	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off					0.10	mJ
R_{thJC}	thermal resistance junction to case	with heatsink compound; IXYS test setup				0.55	K/W
R_{thJH}	thermal resistance junction to heatsink					0.62	K/W

Source-Drain Diode				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.		
V_{SD}	forward voltage drop	$I_F = 40 \text{ A}$; $V_{GS} = -5 \text{ V}$		5.2			V
		$T_{VJ} = 25^\circ\text{C}$		4.6			V
t_{rr}	reverse recovery time	$V_{GS} = -5 \text{ V}$; $I_F = 40 \text{ A}$; $V_R = 800 \text{ V}$ Mosfet gate drive: $V_{GS} = -5 / 20 \text{ V}$; $R_G = 10 \Omega$				16	ns
Q_{RM}	reverse recovery charge (intrinsic diode)					330	nC
I_{RM}	max. reverse recovery current					35	A
dI_F/dt	current slew rate					4800	A/μs
t_{rr}	reverse recovery time	$V_{GS} = -5 \text{ V}$; $I_F = 40 \text{ A}$; $V_R = 800 \text{ V}$ Mosfet gate drive: $V_{GS} = -5 / 20 \text{ V}$; $R_G = 10 \Omega$				26	ns
Q_{RM}	reverse recovery charge (intrinsic diode)					810	nC
I_{RM}	max. reverse recovery current					45	A
dI_F/dt	current slew rate					4600	A/μs

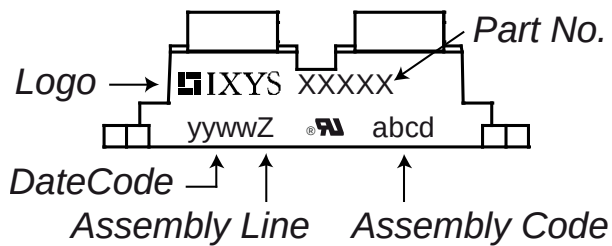
Note:

When using SiC Body Diode the maximum recommended $V_{GS} = -5\text{V}$

Package SOT-227B (minibloc)

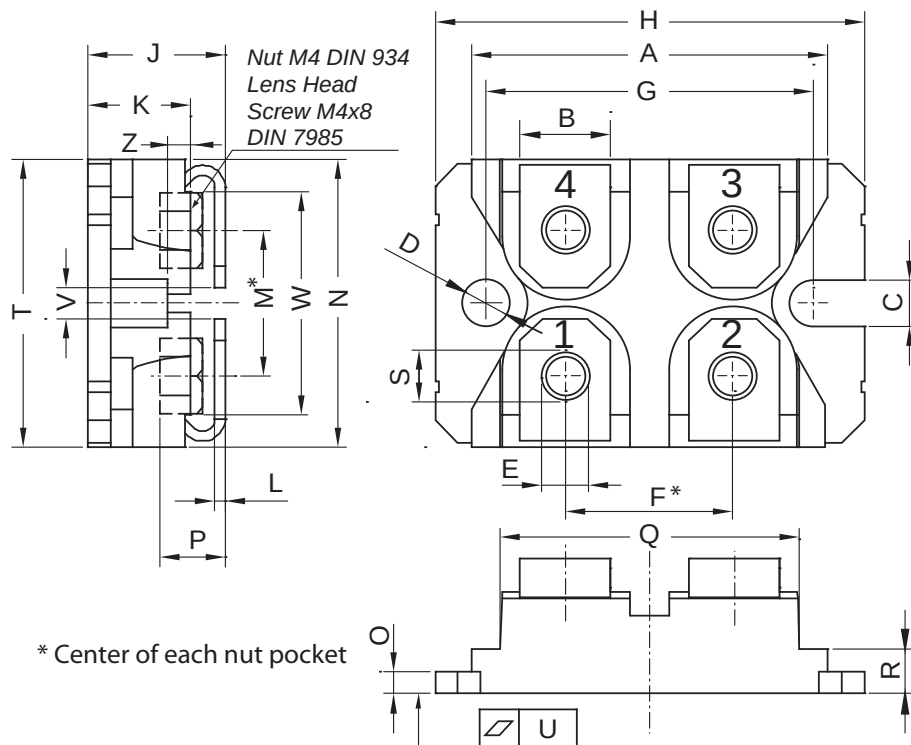
Symbol	Definitions	Conditions	min.	Ratings		Unit
				typ.	max.	
I_{RMS}	RMS current	per terminal				A
T_{stg}	storage temperature		-40		150	°C
T_{op}	operation temperature		-40		150	°C
T_{vj}	virtual junction temperature		-40		175	°C
Weight				30		g
M_D	mounting torque		1.1		1.5	Nm
M_T	terminal torque		1.1		1.5	Nm
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to backside terminal to terminal	10.5 / 3.2			mm
$d_{Spb/Apb}$			8.6 / 6.8			mm
V_{ISOL}	isolation voltage	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz},$ $t = 1 \text{ sec.}$ $t = 1 \text{ minute}$	3000 2500			V V

Product Marking

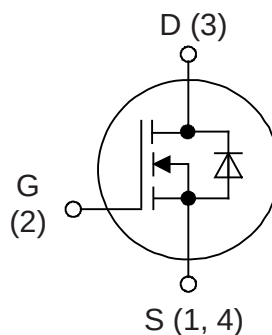


Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	IXFN50N120SiC	IXFN50N120SiC	Tube	10	515282

Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106



Curves

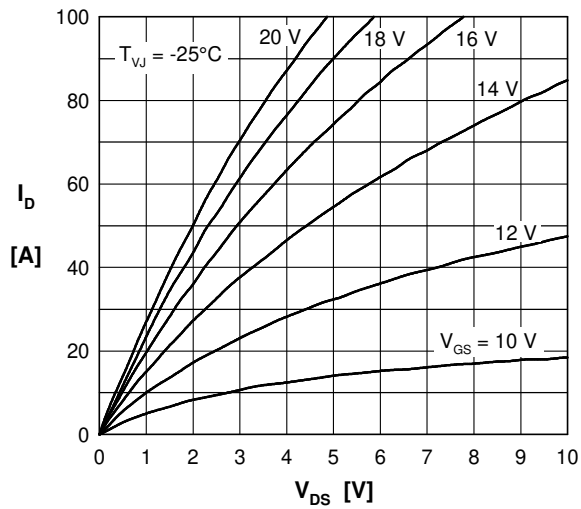


Fig. 1 Typical output characteristics (-25°C)

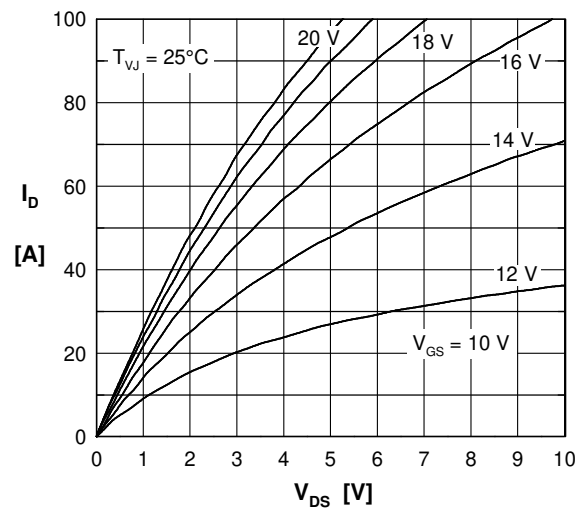


Fig. 2 Typical output characteristics (25°C)

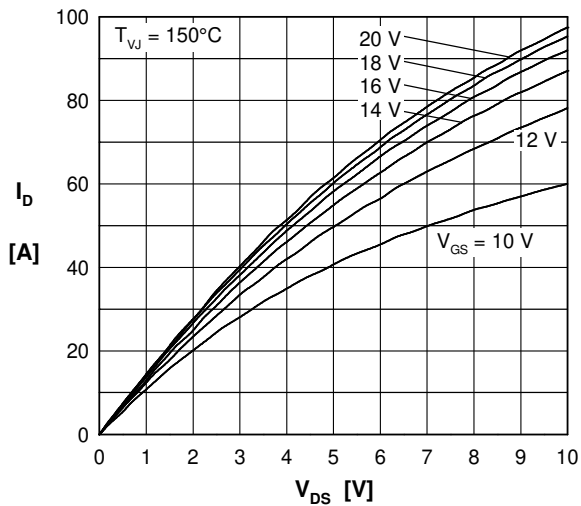


Fig. 3 Typical output characteristics (150°C)

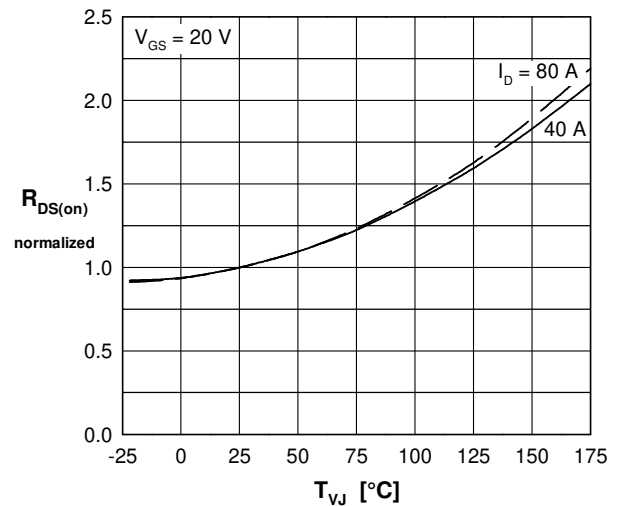


Fig. 4 $R_{DS(on)}$ normalized vs. junction temperature T_{VJ}

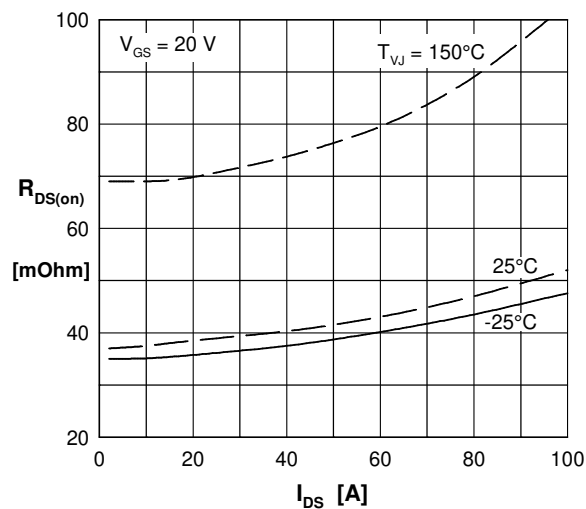


Fig. 5 $R_{DS(on)}$ versus drain current

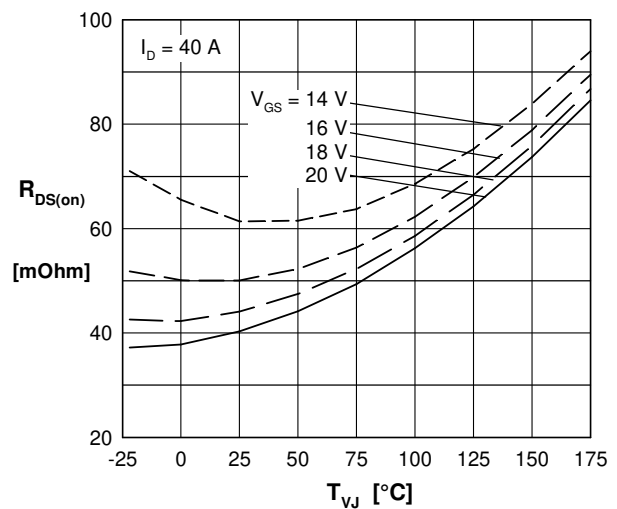


Fig. 6 $R_{DS(on)}$ versus junction temperature T_{VJ}

Curves

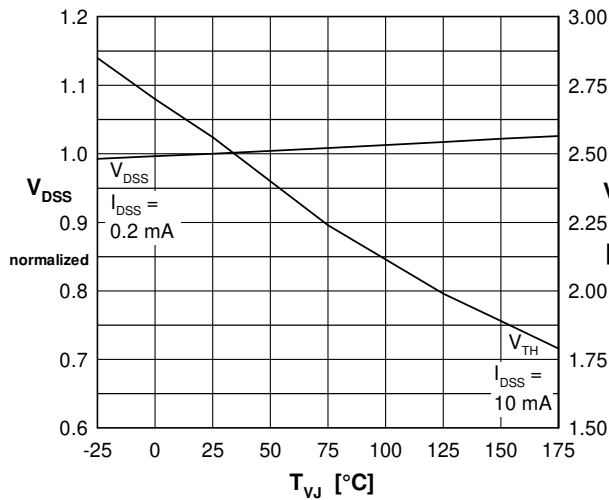


Fig. 7 Norm. breakdow V_{DS} & treshhold voltage V_{TH} versus junction temperature T_{VJ}

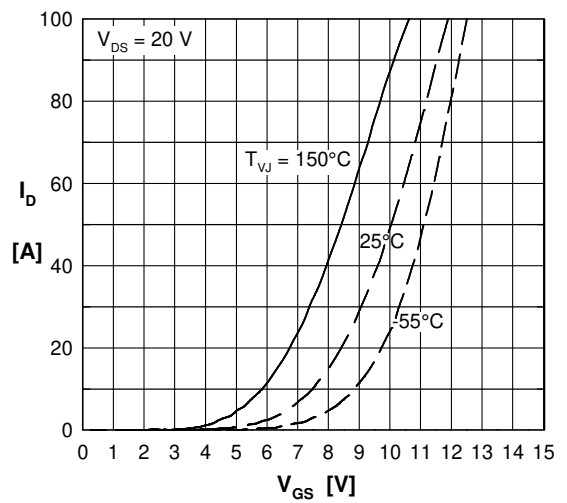


Fig. 8 Typical transfer characteristics

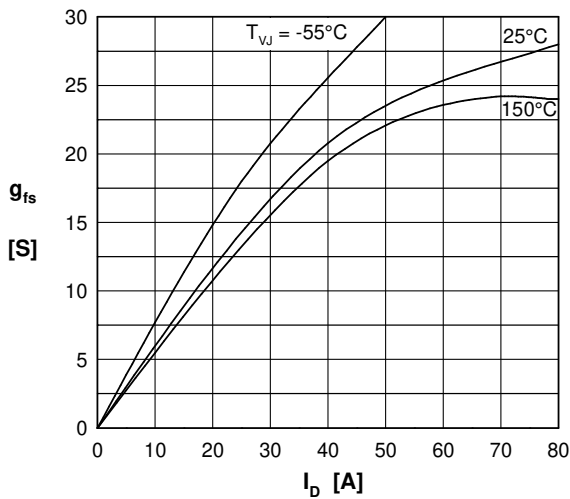


Fig. 9 Typical forward transconductance

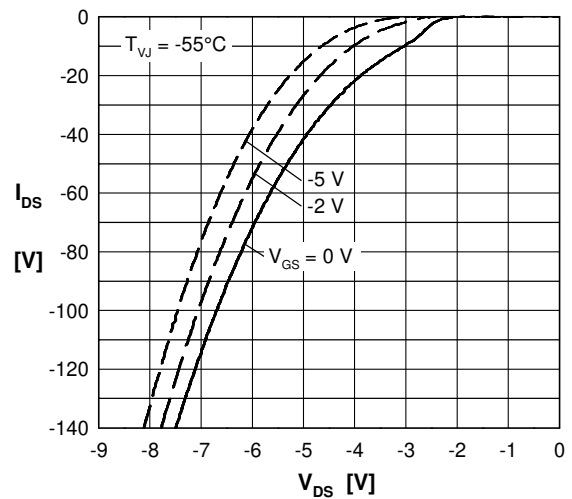


Fig. 10 Forward voltage drop of intrinsic diode versus V_{DS} measured at -55°C

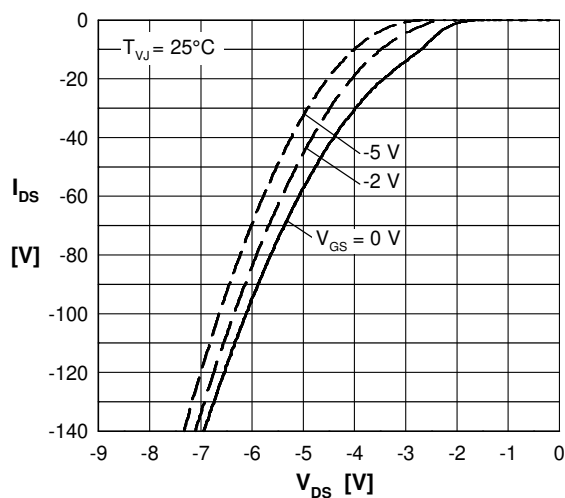


Fig. 11 Forward voltage drop of intrinsic diode versus V_{DS} measured at 25°C

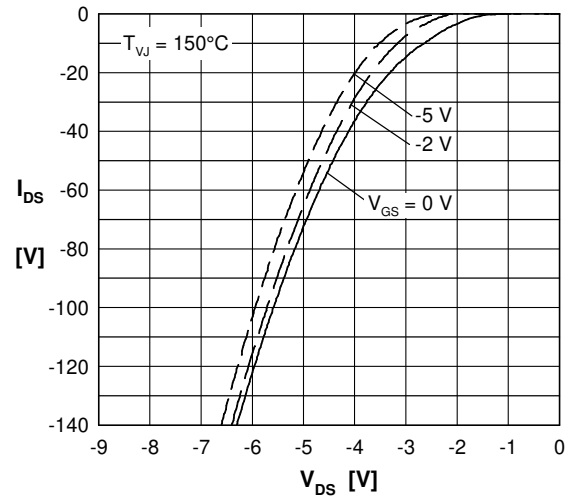


Fig. 12 Forward voltage drop of intrinsic diode versus V_{DS} measured at 150°C

Curves

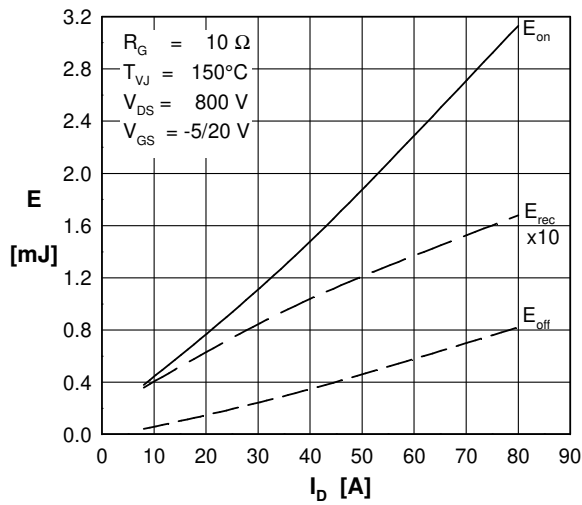


Fig. 13 Typical switching energy versus drain current

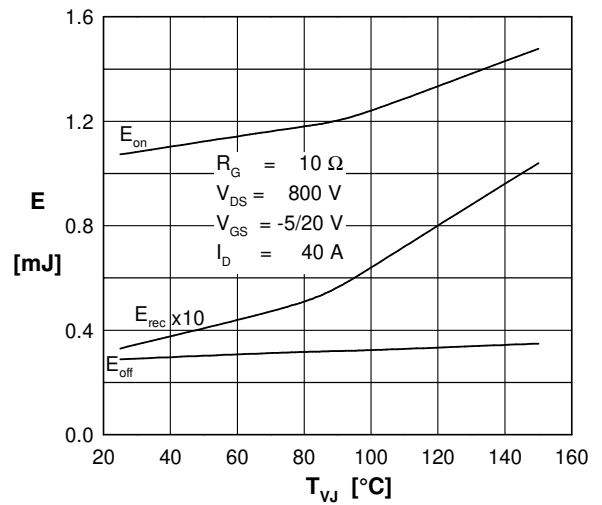


Fig. 14 Typical switching energy versus temperature

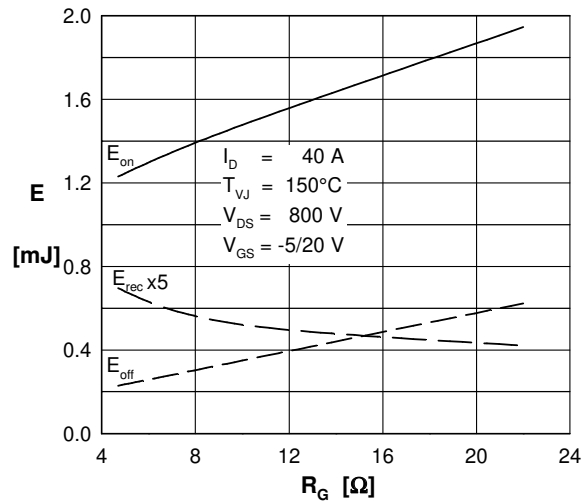


Fig. 15 Typical switching energy versus external gate resistor

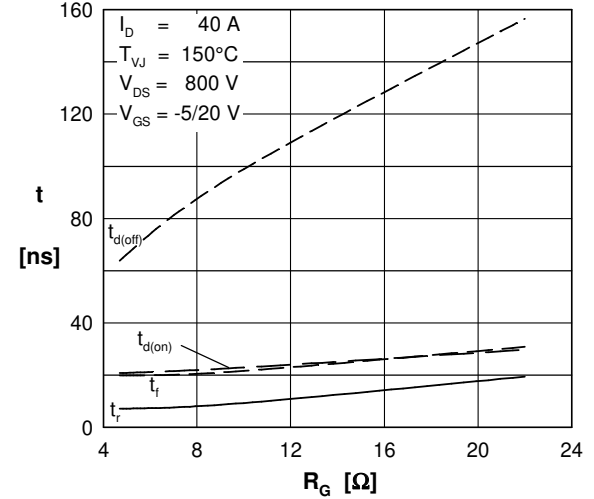


Fig. 16 Typical switching time versus external gate resistor

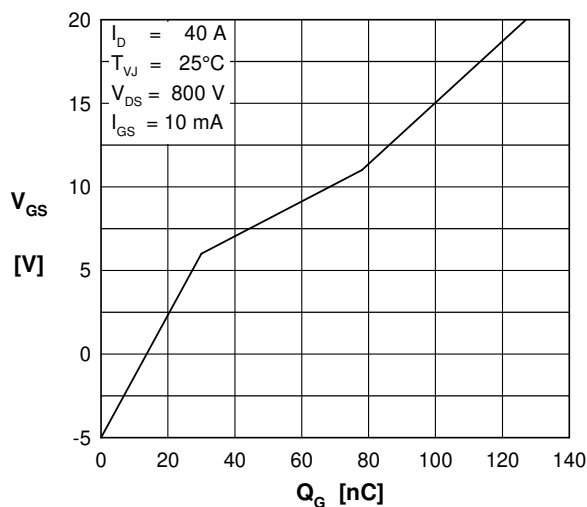


Fig. 17 Typical turn on gate charge, trendline

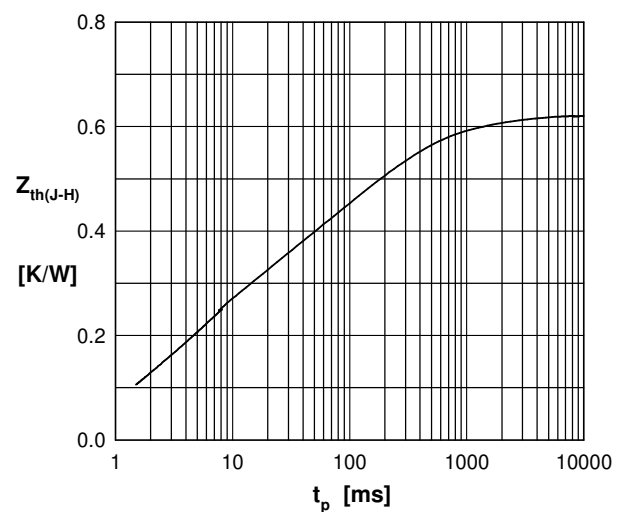


Fig. 18 Typical transient thermal impedance