

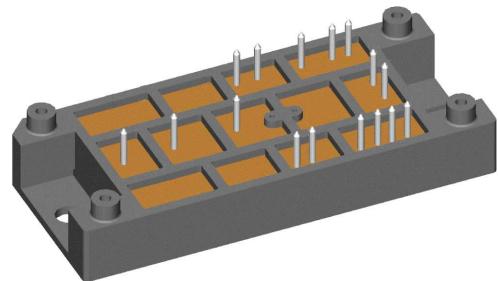
Standard Rectifier Module

3~ Rectifier	Brake Chopper
$V_{RRM} = 1600 \text{ V}$	$V_{CES} = 1200 \text{ V}$
$I_{DAV} = 180 \text{ A}$	$I_{C25} = 180 \text{ A}$
$I_{FSM} = 1100 \text{ A}$	$V_{CE(sat)} = 1.7 \text{ V}$

3~ Rectifier Bridge + Brake Unit + NTC

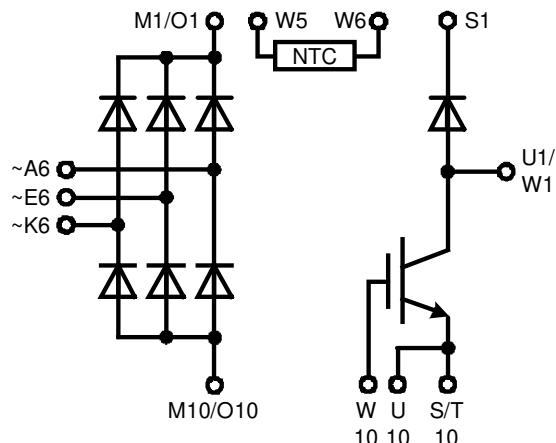
Part number

VUB120-16NOXT



Backside: isolated

 E72873



Features / Advantages:

- Package with DCB ceramic base plate
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current
- NTC
- X2PT - 2nd generation Xtreme light Punch Through
- Rugged X2PT design results in:
 - short circuit rated for 10 μsec .
 - very low gate charge
 - low EMI
 - square RBSOA @ 2x I_c
- Thin wafer technology combined with X2PT design results in a competitive low $V_{CE(sat)}$ and low thermal resistance

Applications:

- 3~ Rectifier with brake unit for drive inverters

Package: V2-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

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Rectifier

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1600	V
I_R	reverse current	$V_R = 1600 \text{ V}$ $V_R = 1600 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		100 2	μA mA
V_F	forward voltage drop	$I_F = 60 \text{ A}$ $I_F = 180 \text{ A}$ $I_F = 60 \text{ A}$ $I_F = 180 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.16 1.55 1.09 1.59	V V
I_{DAV}	bridge output current	$T_C = 90^\circ\text{C}$ rectangular $d = \frac{1}{3}$	$T_{VJ} = 150^\circ\text{C}$		180	A
V_{F0} r_F	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		0.81 4.4	V $\text{m}\Omega$
R_{thJC}	thermal resistance junction to case				0.6	K/W
R_{thCH}	thermal resistance case to heatsink			0.2		K/W
P_{tot}	total power dissipation		$T_C = 25^\circ\text{C}$		205	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		1.10 1.19 935 1.01	kA kA A kA
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		6.05 5.89 4.37 4.25	kA^2s kA^2s kA^2s kA^2s
C_J	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$	37		pF

Brake IGBT + Diode

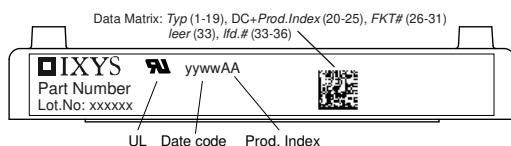
Symbol	Definition	Conditions	Ratings				
			min.	typ.	max.	Unit	
V_{CES}	collector emitter voltage	$T_{VJ} = 25^\circ C$			1200	V	
V_{GES}	max. DC gate voltage				± 20	V	
V_{GEM}	max. transient gate emitter voltage				± 30	V	
I_{C25}	collector current	$T_C = 25^\circ C$			180	A	
I_{C80}		$T_C = 80^\circ C$			140	A	
P_{tot}	total power dissipation	$T_C = 25^\circ C$			500	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 100 A; V_{GE} = 15 V$	$T_{VJ} = 25^\circ C$	1.7	2.1	V	
			$T_{VJ} = 125^\circ C$	1.9		V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 4 mA; V_{GE} = V_{CE}$	$T_{VJ} = 25^\circ C$	6	6.8	7.5	V
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0 V$	$T_{VJ} = 25^\circ C$		0.1	mA	
			$T_{VJ} = 125^\circ C$	0.1		mA	
I_{GES}	gate emitter leakage current	$V_{GE} = \pm 20 V$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600 V; V_{GE} = 15 V; I_C = 100 A$		340		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600 V; I_C = 100 A$ $V_{GE} = \pm 15 V; R_G = 6.8 \Omega$	$T_{VJ} = 125^\circ C$	230		ns	
t_r	current rise time			70		ns	
$t_{d(off)}$	turn-off delay time			380		ns	
t_f	current fall time			230		ns	
E_{on}	turn-on energy per pulse			12.5		mJ	
E_{off}	turn-off energy per pulse			11.5		mJ	
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15 V; R_G = 6.8 \Omega$	$T_{VJ} = 125^\circ C$				
I_{CM}		$V_{CEK} = 1200 V$			300	A	
SCSOA	short circuit safe operating area	$V_{CEK} = 1200 V$					
t_{sc}	short circuit duration	$V_{CE} = 720 V; V_{GE} = \pm 15$	$T_{VJ} = 125^\circ C$		10	μs	
I_{sc}	short circuit current	$R_G = 6.8 \Omega$; non-repetitive		450		A	
R_{thJC}	thermal resistance junction to case				0.25	K/W	
R_{thCH}	thermal resistance case to heatsink			0.10		K/W	

Brake Diode

V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^\circ C$		1200	V
I_{F25}	forward current	$T_C = 25^\circ C$		48	A
I_{F80}		$T_C = 80^\circ C$		32	A
V_F	forward voltage	$I_F = 30 A$	$T_{VJ} = 25^\circ C$	2.75	V
			$T_{VJ} = 125^\circ C$	1.60	V
I_R	reverse current	$V_R = V_{RRM}$	$T_{VJ} = 25^\circ C$	0.25	mA
			$T_{VJ} = 125^\circ C$	1	mA
Q_{rr}	reverse recovery charge	$V_R = 600 V$ $-di_F/dt = 1000 A/\mu s$ $I_F = 30 A; V_{GE} = 0 V$	$T_{VJ} = 125^\circ C$	5.2	μC
				50	A
				300	ns
				1.9	mJ
R_{thJC}	thermal resistance junction to case			0.9	K/W
R_{thCH}	thermal resistance case to heatsink			0.3	K/W

Package V2-Pack

Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			100	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		125	°C
Weight				76		g
M_D	mounting torque		2		2.5	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm
$d_{Spb/Apb}$		terminal to backside	12.0			mm
V_{ISOL}	isolation voltage	$t = 1 \text{ second}$ $t = 1 \text{ minute}$	3600 50/60 Hz, RMS; $I_{ISOL} \leq 1 \text{ mA}$	3000		V



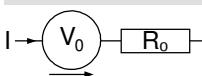
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUB120-16NOXT	VUB120-16NOXT	Box	6	520468

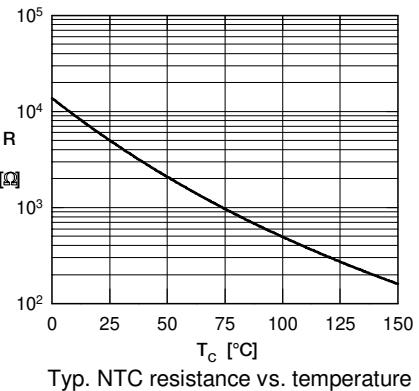
Similar Part	Package	Voltage class
VUB120-16NOX	V2-Pack	1600

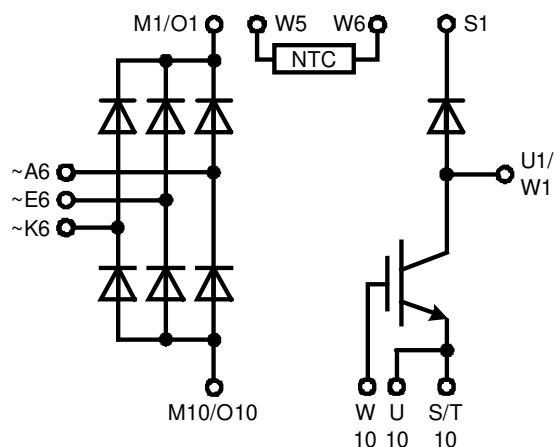
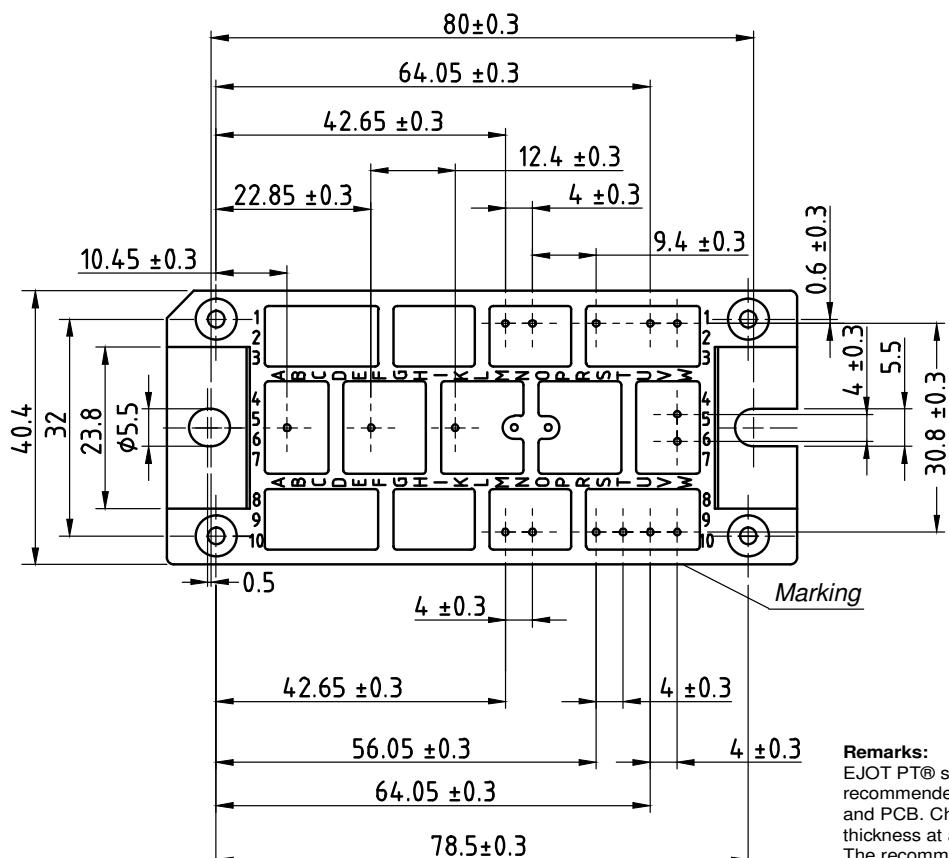
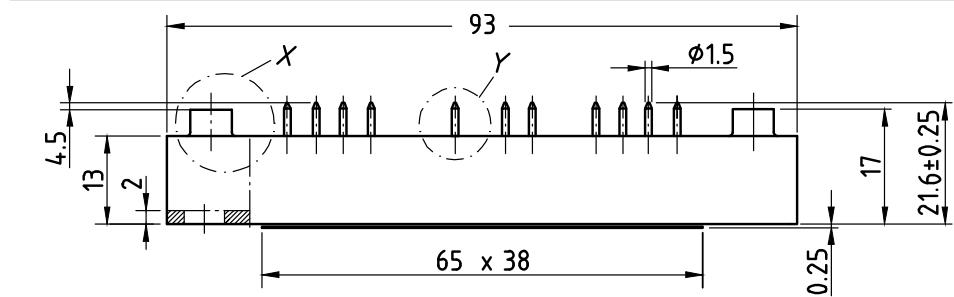
Temperature Sensor NTC

Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	resistance	$T_{VJ} = 25^\circ\text{C}$	4.75	5	5.25	kΩ
$B_{25/50}$	temperature coefficient			3375		K

Equivalent Circuits for Simulation
 $* \text{on die level}$
 $T_{VJ} = 150^\circ\text{C}$

	Rectifier	Brake Diode	
$V_{0\max}$	threshold voltage	0.81	1.31
$R_{0\max}$	slope resistance *	3.2	8



Outlines V2-Pack


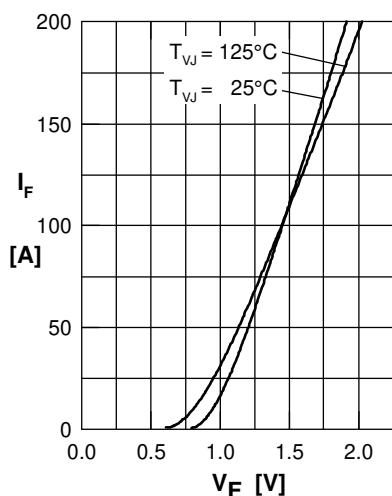
Rectifier


Fig. 1 Forward current vs.
voltage drop per diode

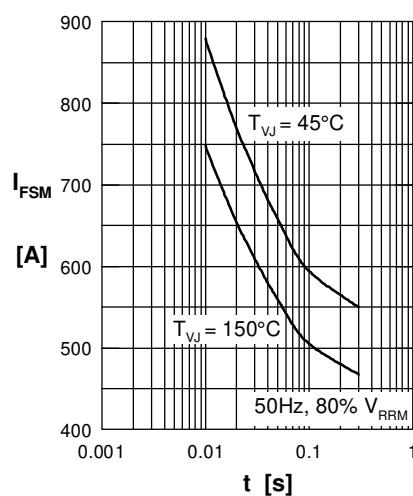


Fig. 2 Surge overload current
vs. time per diode

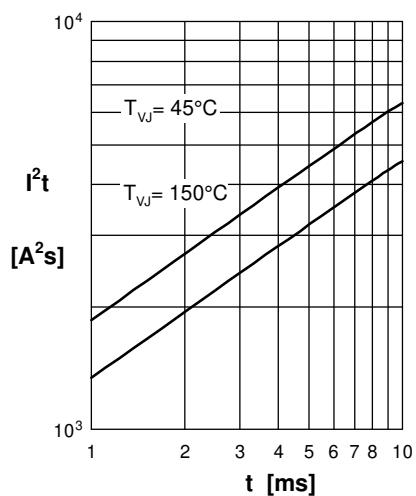


Fig. 3 I^2t vs. time per diode

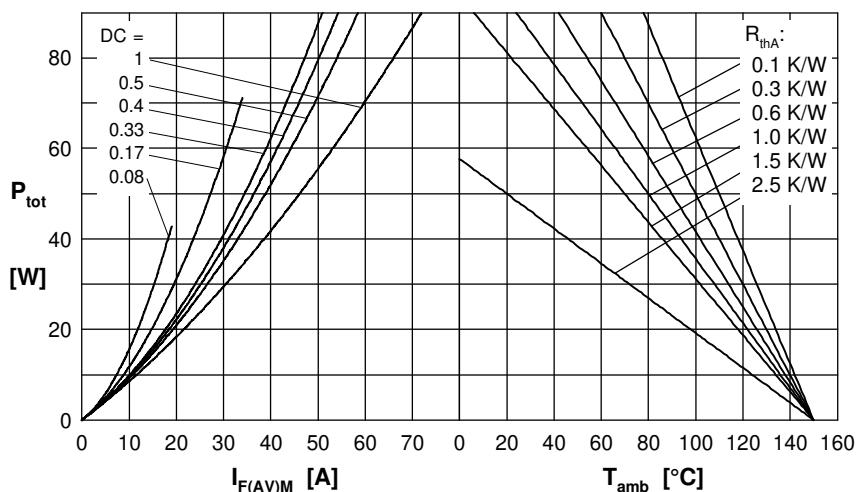


Fig. 4 Power dissipation vs. forward current
and ambient temperature per diode

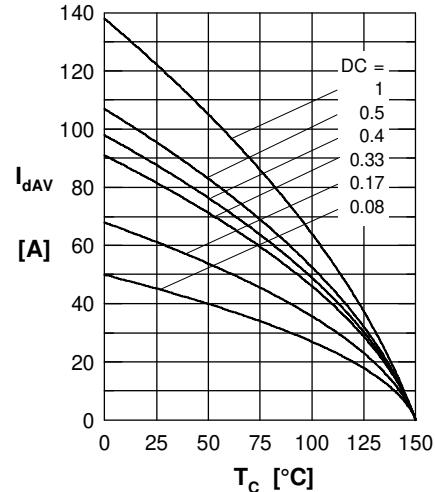


Fig. 5 Max. forward current vs.
case temperature per diode

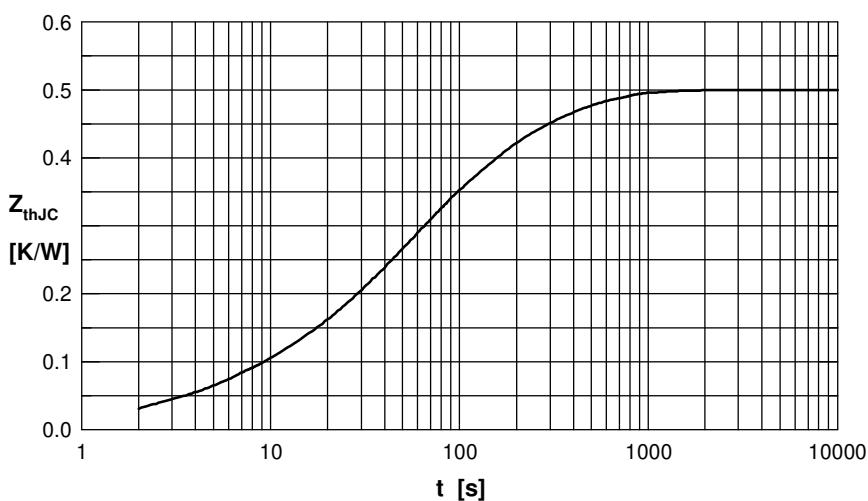
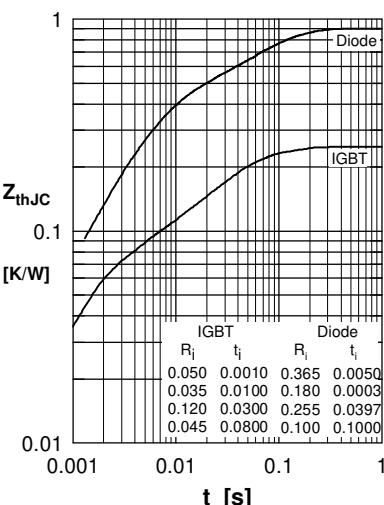
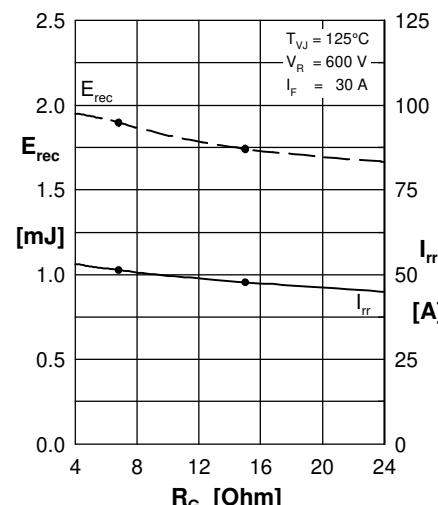
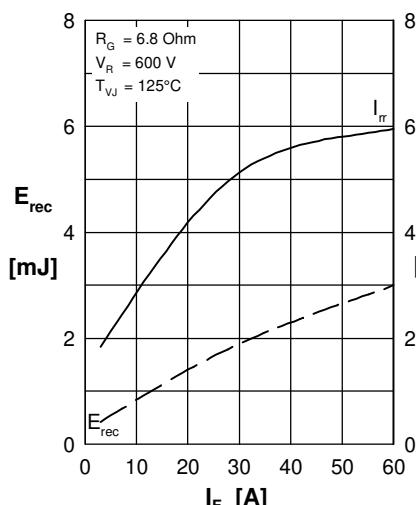
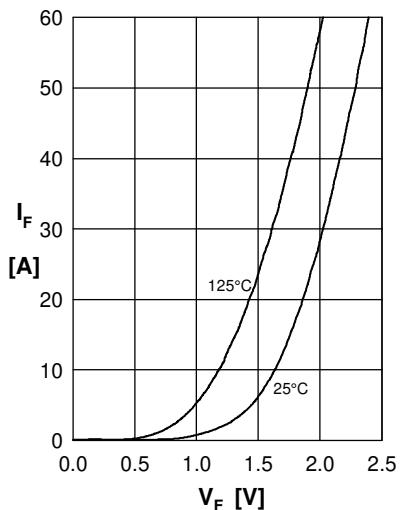
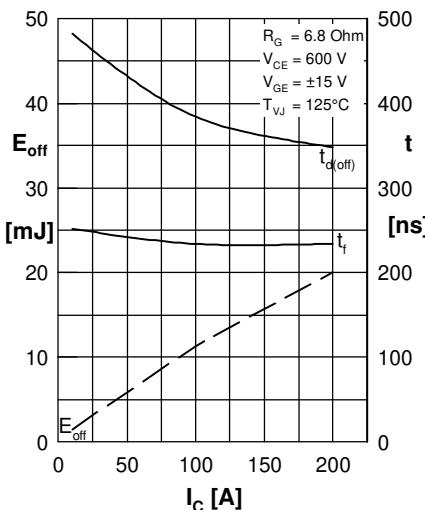
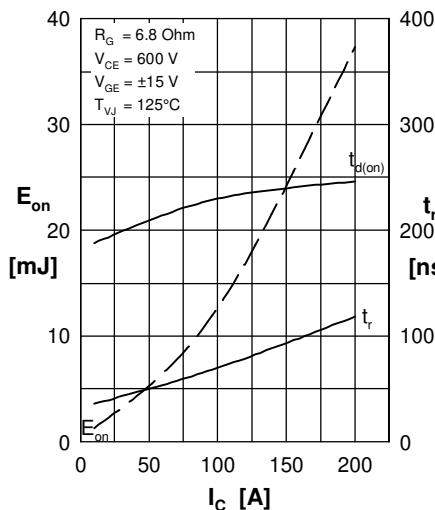
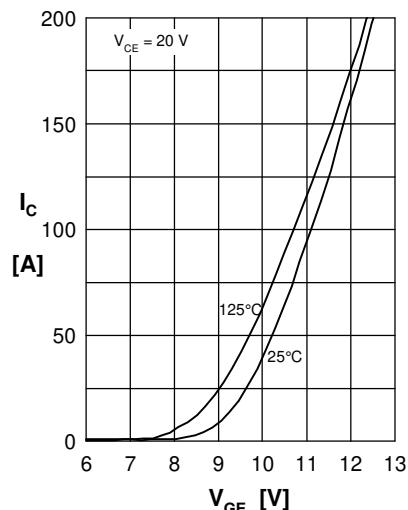
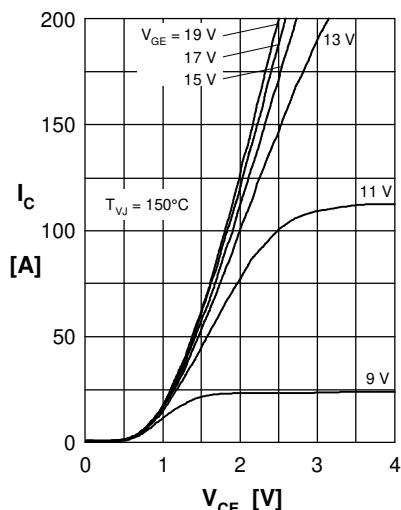
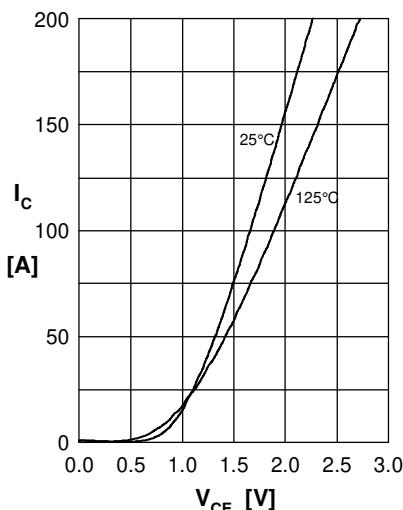


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.040	0.004
2	0.003	0.010
3	0.140	0.030
4	0.120	0.300
5	0.197	0.080

Brake IGBT + Diode





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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