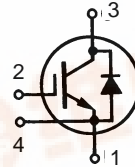
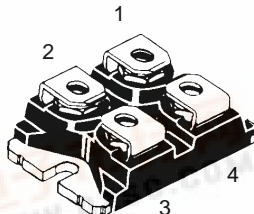




High Voltage IGBT with Diode IXSN 35N120AU1

$V_{CES} = 1200\text{ V}$
 $I_{C25} = 70\text{ A}$
 $V_{CE(sat)} = 4\text{ V}$



Symbol	Test Conditions	Maximum Ratings	miniBLOC, SOT-227 B
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200 V	 <p>1 = Emitter ①, 3 = Collector 2 = Gate, 4 = Emitter ①</p> <p>① Either Emitter terminal can be used as Main or Kelvin Emitter</p> <p>Features</p> <ul style="list-style-type: none"> International standard package miniBLOC (ISOTOP) compatible Aluminium-nitride isolation <ul style="list-style-type: none"> high power dissipation Isolation voltage 3000 V~ Low $V_{CE(sat)}$ <ul style="list-style-type: none"> for minimum on-state conduction losses Fast Recovery Epitaxial Diode <ul style="list-style-type: none"> short t_{rr} and I_{RM} Low collector-to-case capacitance (< 50 pF) <ul style="list-style-type: none"> reduces RFI Low package inductance (< 10 nH) <ul style="list-style-type: none"> easy to drive and to protect <p>Applications</p> <ul style="list-style-type: none"> AC motor speed control DC servo and robot drives DC choppers Uninterruptible power supplies (UPS) Switch-mode and resonant-mode power supplies <p>Advantages</p> <ul style="list-style-type: none"> Space savings Easy to mount with 2 screws High power density
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1\text{ M}\Omega$	1200 A	
V_{GES}	Continuous	± 20 V	
V_{GEM}	Transient	± 30 V	
I_{C25}	$T_C = 25^\circ\text{C}$	70 A	
I_{C90}	$T_C = 90^\circ\text{C}$	35 A	
I_{CM}	$T_C = 25^\circ\text{C}, 1\text{ ms}$	140 A	
SSOA (RBSOA)	$V_{GE} = 15\text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 22\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$	$I_{CM} = 70$ @ 0.8 V_{CES} A	
t_{SC} (SCSOA)	$V_{GE} = 15\text{ V}, V_{CE} = 0.6 \cdot V_{CES}, T_J = 125^\circ\text{C}$ $R_G = 22\ \Omega$, non repetitive	10 μs	
P_C	$T_C = 25^\circ\text{C}$	300 W	
P_D		175 W	
V_{ISOL}	50/60 Hz	$t = 1\text{ min}$ 2500 V~	
	$I_{ISOL} \leq 1\text{ mA}$	$t = 1\text{ s}$ 3000 V~	
T_J		-55 ... +150 $^\circ\text{C}$	
T_{JM}		150 $^\circ\text{C}$	
T_{stg}		-55 ... +150 $^\circ\text{C}$	
M_d	Mounting torque	1.5/13 Nm/lb.in.	
	Terminal connection torque (M4)	1.5/13 Nm/lb.in.	
Weight		30 g	

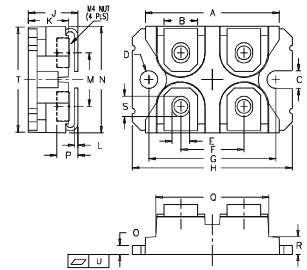
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 5\text{ mA}, V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 4\text{ mA}, V_{CE} = V_{GE}$	4		V
$I_{CES} \text{ ①}$	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0\text{ V}$	$T_J = 25^\circ\text{C}$		750 μA
		$T_J = 125^\circ\text{C}$		15 mA
I_{GES}	$V_{CE} = 0\text{ V}, V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15\text{ V}$			4 V

② Device must be heat sunk during high temperature leakage test to avoid thermal runaway.



Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	I _C = I _{C90} ; V _{CE} = 10 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %	20	26	S
I_{C(on)}	V _{CE} = 10 V, V _{GE} = 15 V		170	A
C_{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		3900	pF
C_{oes}		295	pF	
C_{res}		60	pF	
Q_g	I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		150	190 nC
Q_{ge}		40	60 nC	
Q_{gc}		70	100 nC	
t_{d(on)}	Inductive load, T_J = 25°C I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.8 • V _{CES} , R _G = 2.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		80	ns
t_{ri}		150	ns	
t_{d(off)}		400	900 ns	
t_{fi}		500	700 ns	
E_{off}		10	mJ	
t_{d(on)}		Inductive load, T_J = 125°C I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.8 • V _{CES} , R _G = 2.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		80
t_{ri}	150		ns	
t_{d(off)}	400		ns	
t_{fi}	700		ns	
E_{on}	6		mJ	
E_{off}	15		mJ	
R_{thJC}				0.42 K/W
R_{thCK}		0.05		K/W

miniBLOC, SOT-227 B



M4 screws (4x) supplied

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	38.00	38.23	1.496	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004

Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
V_F	I _F = I _{C90} , V _{GE} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			2.35 V
I_{RM}	I _F = I _{C90} , V _{GE} = 0 V, -di _F /dt = 480 A/μs V _R = 540 V I _F = 1 A; -di/dt = 200 A/μs; V _R = 30 V		32	35 A
t_{rr}		T _J = 100°C	225	ns
		T _J = 25°C	40	60 ns
R_{thJC}				0.71 K/W

Fig. 1 Saturation Characteristics

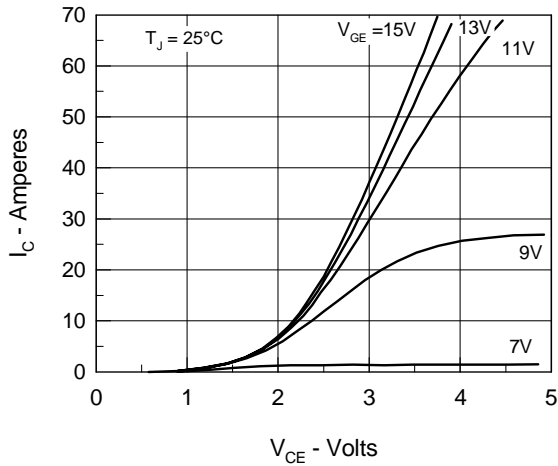


Fig. 2 Output Characteristics

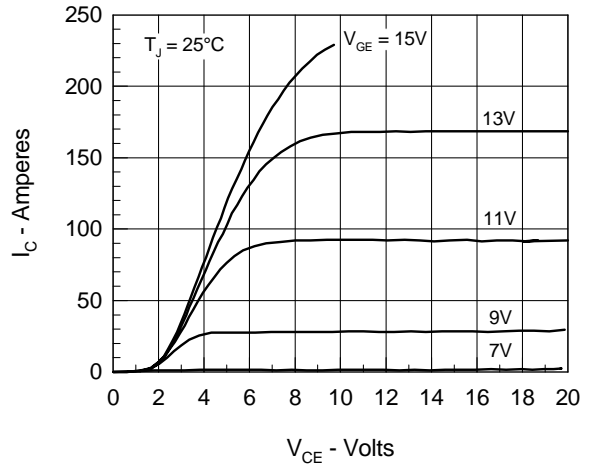


Fig. 3 Collector-Emitter Voltage vs. Gate-Emitter Voltage

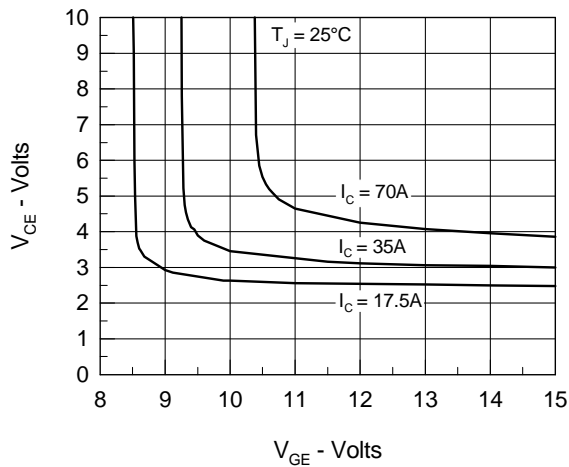


Fig. 4 Temperature Dependence of Output Saturation Voltage

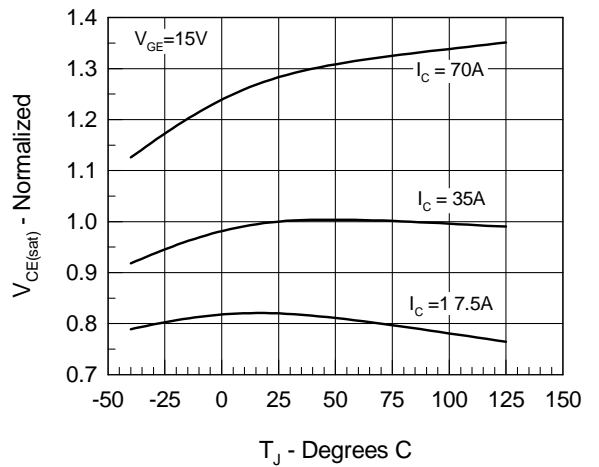


Fig. 5 Input Admittance

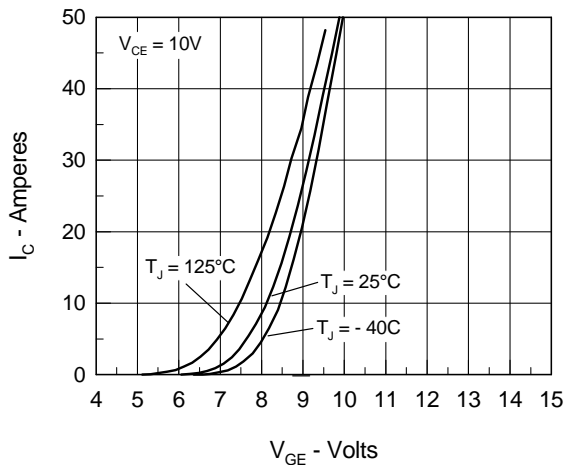


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

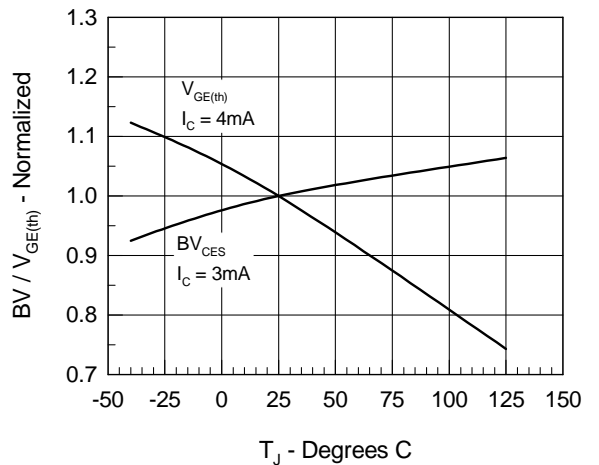


Fig.7 Turn-Off Energy per Pulse and Fall Time on Collector Current

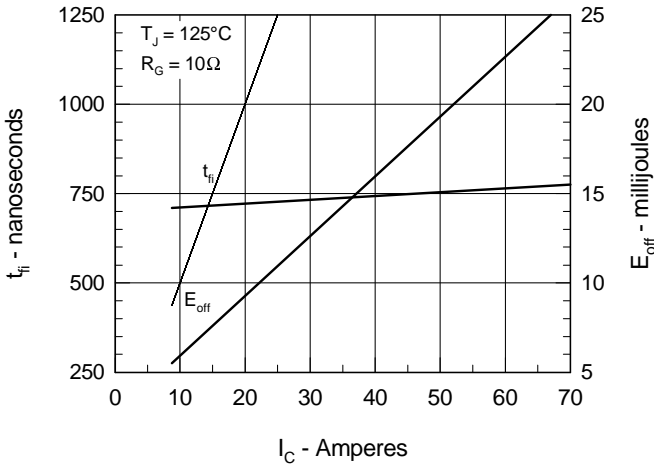


Fig.8 Dependence of Turn-Off Energy Per Pulse and Fall Time on R_G

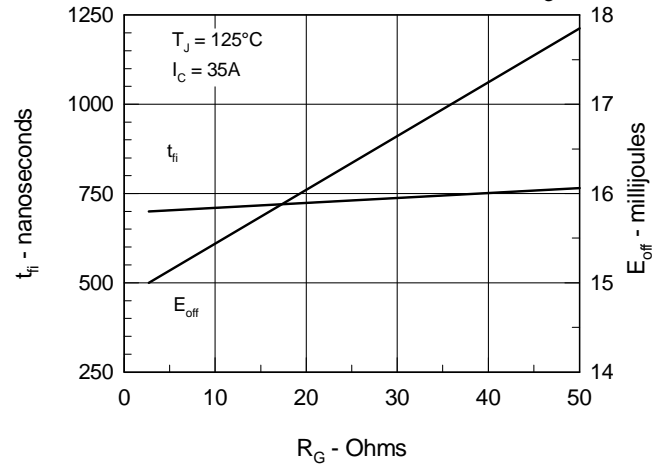


Fig.9 Gate Charge Characteristic Curve

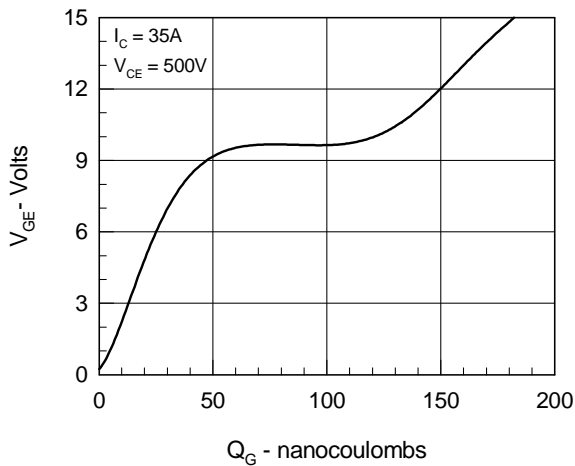


Fig.10 Turn-Off Safe Operating Area

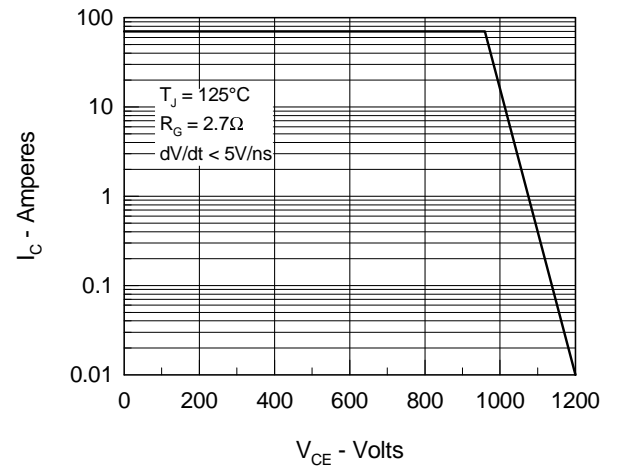


Fig.11 Transient Thermal Impedance

