

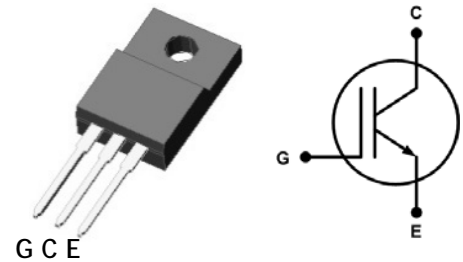
360V, 50A High Speed Punch Through IGBT

Features

- Low gate charge
- Punch Through Technology
- Low saturation voltage:
 $V_{CE(sat)} = 1.6V$ (@ $I_C = 50A$, $T_C = 25^\circ C$)
- RoHS compliant product

Applications

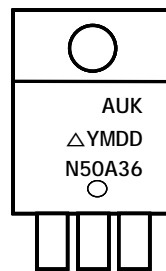
- General purpose inverters
- PDP
- UPS



TO-220F-3L

Ordering Information

Part Number	Marking	Package
SGTN50A36FD	N50A36	TO-220F



Column 1: Manufacturer
 Column 2: Production Information
 e.g.) ΔYMDD
 -. Δ: Factory Management Code
 -. YMDD: Date Code (Year, Month, Date)
 Column 3: Device Code

Absolute maximum ratings ($T_C=25^\circ C$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit	
Collector-emitter voltage	V_{CES}	360	V	
Continuous collector current ⁽¹⁾	I_C	$T_C=25^\circ C$	100	A
		$T_C=100^\circ C$	50	A
Pulsed collector current ⁽²⁾	I_{CM}	240	A	
Gate-emitter voltage	V_{GES}	± 30	V	
Turn-off safe area	-	200	A	
Power dissipation	P_D	30	W	
Operating and storage temperature range	T_J, T_{stg}	-55 to 150	$^\circ C$	
Maximum lead temperature for soldering purpose	T_L	300	$^\circ C$	

¹⁾ Collector current limited by maximum junction temperature

²⁾ Pulse width limited by maximum junction temperature and turn-off within RBSOA.

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 4.16	°C/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

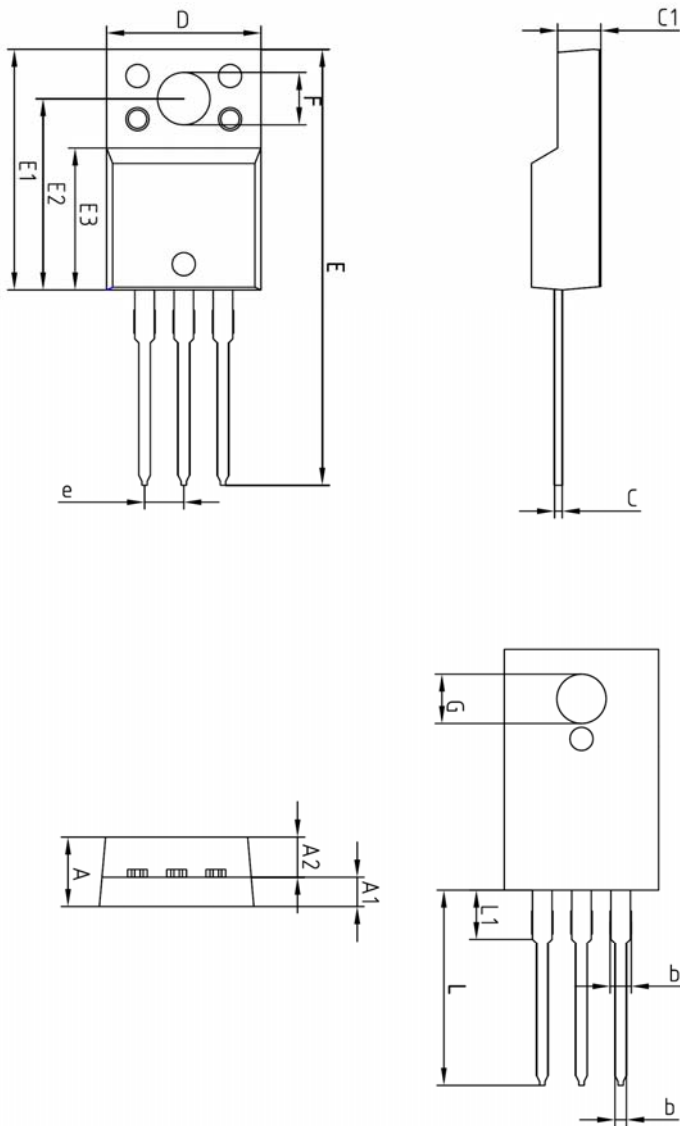
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off-Characteristics						
Collector-emitter breakdown voltage	BV_{CES}	$I_C=500\mu\text{A}$, $V_{GS}=0$	360	-	-	V
Breakdown voltage temperature coefficient	$\frac{\Delta BV_{CES}}{\Delta T_J}$	$I_C=1\text{mA}$, reference to 25°C	-	0.5	-	V/°C
Zero gate voltage collector current	I_{CES}	$V_{CE}=360\text{V}$, $V_{GS}=0\text{V}$, $T_C=25^\circ\text{C}$	-	-	10	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 30\text{V}$	-	-	± 400	nA
On-Characteristics						
Gate threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}$, $I_C=250\mu\text{A}$	2	-	4.5	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}$, $I_C=35\text{A}$	-	1.4	1.6	V
		$V_{GE}=15\text{V}$, $I_C=50\text{A}$	-	1.6	1.8	V
Dynamic-Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$	-	1500	-	pF
Output capacitance	C_{oes}		-	100	-	
Reverse transfer capacitance	C_{res}		-	50	-	
Turn-on delay time ^{(3),(4)}	$t_{d(on)}$	$V_{CE}=200\text{V}$, $I_C=35\text{A}$, $R_G=5\Omega$	-	30	-	ns
Rise time ^{(3),(4)}	t_r		-	100	-	
Turn-off delay time ^{(3),(4)}	$t_{d(off)}$		-	100	-	
Fall time ^{(3),(4)}	t_f		-	150	-	
Total gate charge ^{(3),(4)}	Q_g	$V_{CE}=150\text{V}$, $V_{GE}=15\text{V}$, $I_C=35\text{A}$	-	67	-	nC
Gate-emitter charge ^{(3),(4)}	Q_{ge}		-	11.7	-	
Gate-collector charge ^{(3),(4)}	Q_{gs}		-	23.5	-	

³⁾ Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

⁴⁾ Essentially independent of operating temperature typical characteristics

Package Outline Dimensions



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	-	-	4.60	
A1	2.45	2.50	2.55	
A2	1.95	2.00	2.05	
b	0.65	0.75	0.85	
b1	1.07	1.27	1.47	
C	0.40	0.50	0.60	
C1	2.70	2.80	2.90	
D	9.90	10.00	10.10	
E	28.00	-	28.60	
E1	15.50	15.60	15.70	
E2	12.30	12.40	12.50	
E3	9.15	9.20	9.25	
F	3.30	3.40	3.50	
G	3.10	3.20	3.30	
e	2.54 BSC			
L	12.40	-	13.00	
L1	3.46 BSC			

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