

Insulated Gate Bipolar Transistor (IGBT)

BUK856-800A

GENERAL DESCRIPTION

Fast-switching N-channel insulated gate bipolar power transistor in a plastic envelope.

The device is intended for use in motor control, DC/DC and AC/DC converters, and in general purpose high frequency switching applications.

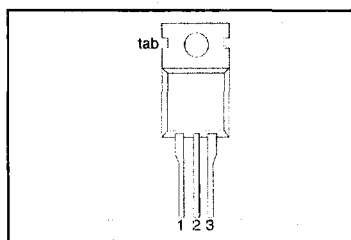
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CE}	Collector-emitter voltage	800	V
I_C	Collector current (DC)	24	A
P_{tot}	Total power dissipation	125	W
V_{CEsat}	Collector-emitter on-state voltage	3.5	V
E_{off}	Turn-off energy Loss	1.0	mJ

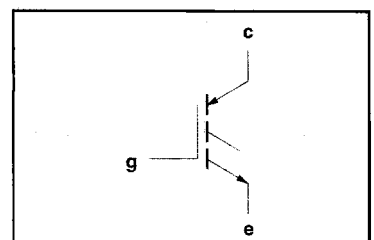
PINNING - TO220AB

PIN	DESCRIPTION
1	gate
2	collector
3	emitter
tab	collector

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CE}	Collector-emitter voltage	-	-5	800	V
V_{CGR}	Collector-gate voltage	$R_{GE} = 20 \text{ k}\Omega$	-	800	V
$\pm V_{GE}$	Gate-emitter voltage	-	-	30	V
I_C	Collector current (DC)	$T_{mb} = 25 \text{ }^\circ\text{C}$	-	24	A
I_C	Collector current (DC)	$T_{mb} = 100 \text{ }^\circ\text{C}$	-	12	A
I_{CLM}	Collector Current (Clamped Inductive Load)	$T_j \leq T_{jmax}$ $V_{CL} \leq 500 \text{ V}$	-	40	A
I_{CM}	Collector current (pulsed peak value, on-state)	$T_j \leq T_{jmax}$	-	50	A
P_{tot}	Total power dissipation	$T_{mb} = 25 \text{ }^\circ\text{C}$	-	125	W
T_{stg}	Storage temperature	-	-55	150	$^\circ\text{C}$
T_j	Junction Temperature	-	-	150	$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
R_{thj-mb}	Junction to mounting base	-	-	1.0	K/W
R_{thj-a}	Junction to ambient	In free air	60	-	K/W

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STATIC CHARACTERISTICS $T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

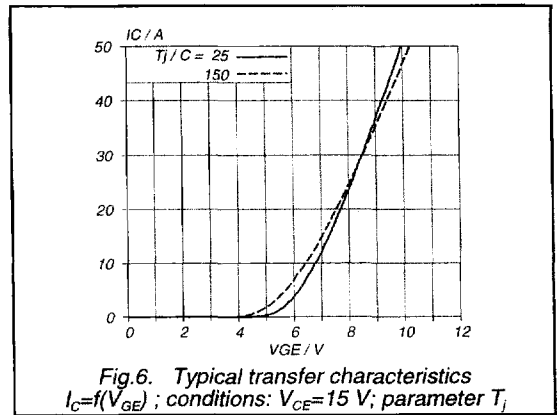
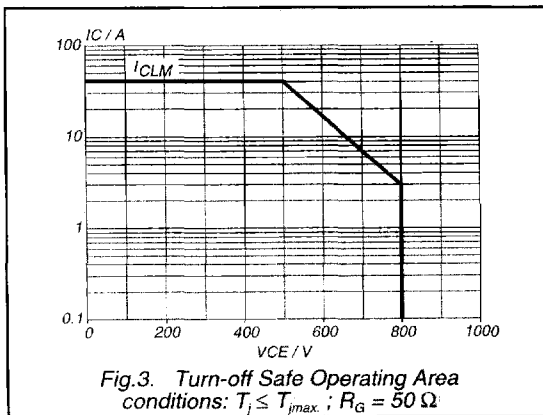
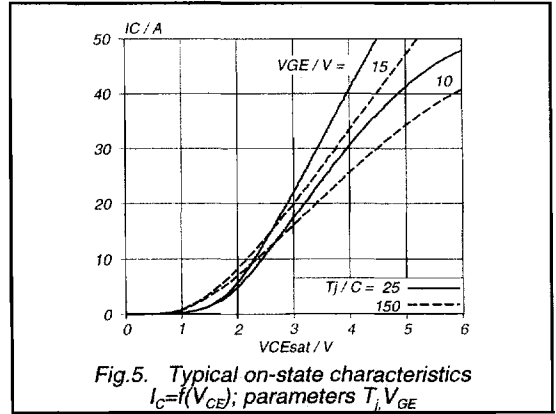
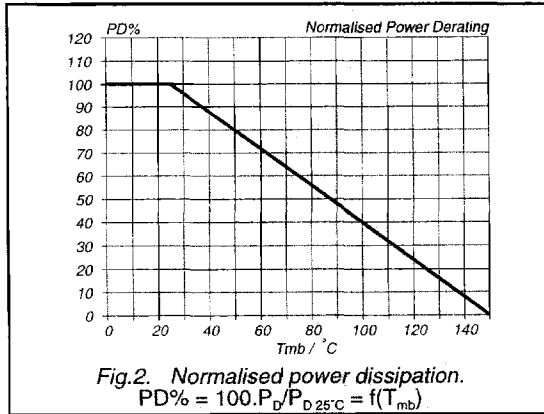
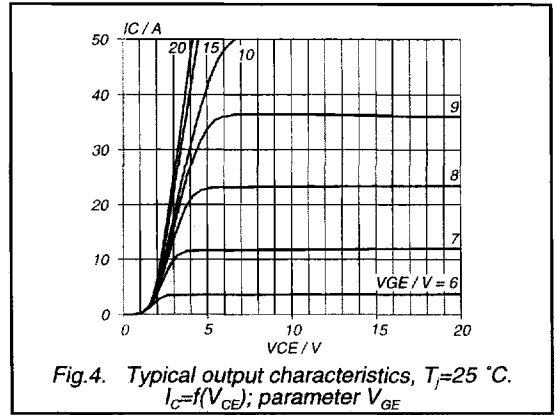
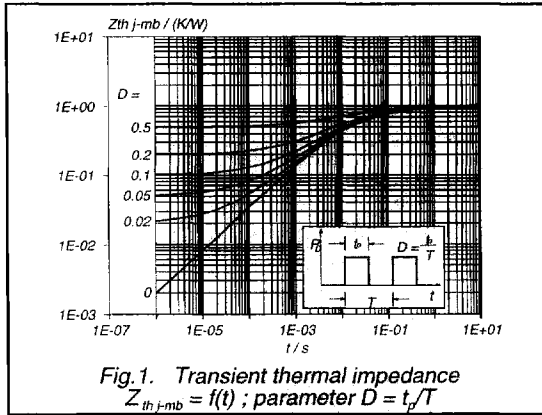
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CES}$	Collector-emitter breakdown voltage	$V_{GE} = 0\text{ V}; I_C = 0.25\text{ mA}$	800	-	-	V
$V_{GE(TO)}$	Gate threshold voltage	$V_{CE} = V_{GE}; I_C = 1\text{ mA}$	3	4	5.5	V
I_{CES}	Zero gate voltage collector current	$V_{CE} = 800\text{ V}; V_{GE} = 0\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$	-	10	200	μA
I_{CES}	Zero gate voltage collector current	$V_{CE} = 800\text{ V}; V_{GE} = 0\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$	-	0.2	1	mA
I_{ECS}	Reverse collector current	$V_{CE} = -5\text{ V}; V_{GE} = 0\text{ V}$	-	0.1	5	mA
I_{GES}	Gate emitter leakage current	$V_{GE} = \pm 30\text{ V}; V_{CE} = 0\text{ V}$	-	10	100	nA
V_{CEsat}	Collector-emitter saturation voltage	$V_{GE} = 15\text{ V}; I_C = 12\text{ A}$	-	2.4	3.5	V
		$V_{GE} = 15\text{ V}; I_C = 24\text{ A}$	-	3.1	-	V

DYNAMIC CHARACTERISTICS $T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
g_{fe}	Forward transconductance	$V_{CE} = 15\text{ V}; I_C = 6\text{ A}$	3	7	-	S
C_{ies}	Input capacitance	$V_{GE} = 0\text{ V}; V_{CE} = 25\text{ V}; f = 1\text{ MHz}$	-	900	1250	pF
C_{oes}	Output capacitance		-	85	120	pF
C_{res}	Feedback capacitance		-	30	50	pF
$t_{d\ on}$	Turn-on delay time	$I_C = 12\text{ A}; V_{CC} = 500\text{ V};$ $V_{GE} = 15\text{ V}; R_G = 25\Omega;$ $T_j = 25\text{ }^{\circ}\text{C};$	-	25	-	ns
t_r	Turn-on rise time		-	45	-	ns
E_{on}	Turn-on Energy Loss		-	0.6	-	mJ
$t_{d\ off}$	Turn-off delay time	Inductive Load Energy Losses include all 'tail' losses	-	230	350	ns
t_f	Turn-off fall time		-	200	400	ns
E_{off}	Turn-off Energy Loss		-	0.5	1	mJ
$t_{d\ on}$	Turn-on delay time	$I_C = 12\text{ A}; V_{CC} = 500\text{ V};$ $V_{GE} = 15\text{ V}; R_G = 25\Omega;$ $T_j = 125\text{ }^{\circ}\text{C};$	-	25	-	ns
t_r	Turn-on rise time		-	45	-	ns
E_{on}	Turn-on Energy Loss		-	0.6	-	mJ
$t_{d\ off}$	Turn-off delay time	Inductive Load Energy Losses include all 'tail' losses	-	300	450	ns
t_f	Turn-off fall time		-	400	800	ns
E_{off}	Turn-off Energy Loss		-	1	2	mJ

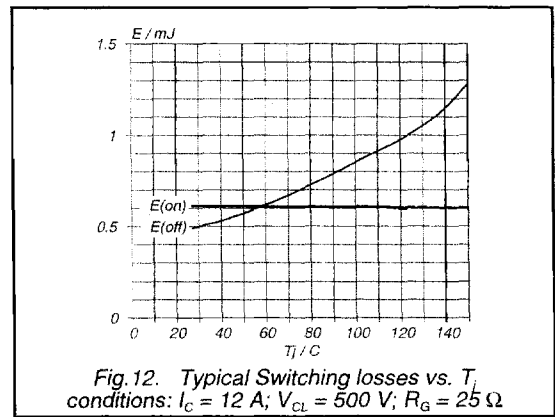
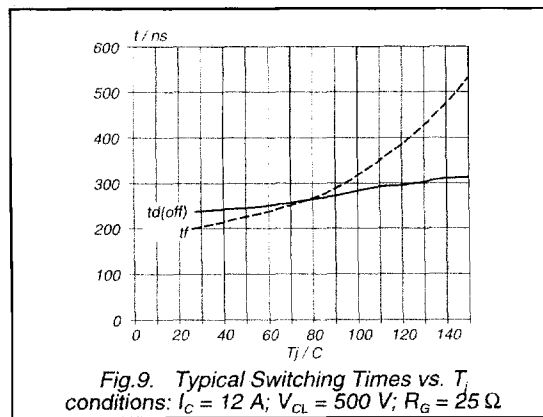
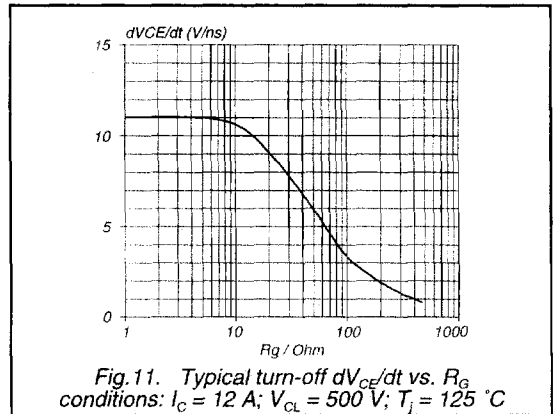
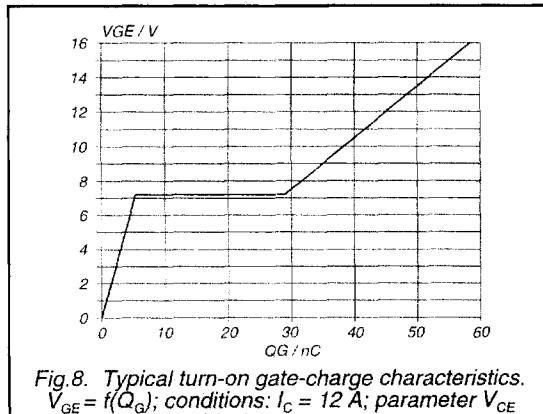
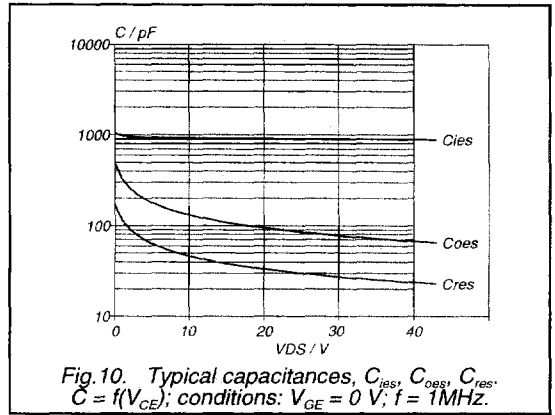
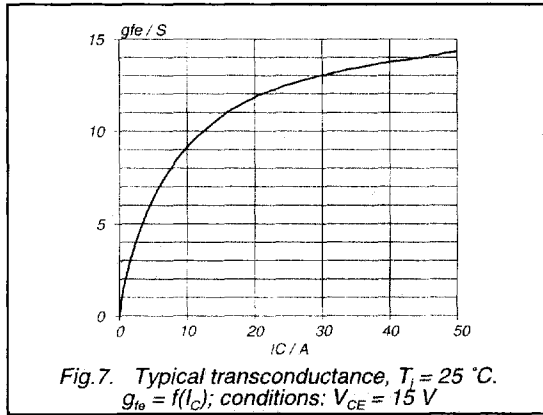
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