TENTATIVE TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR

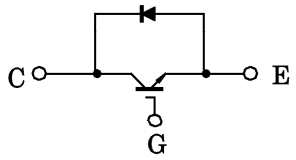
ST1000EX21

HIGH POWER SWITCHING APPLICATIONS

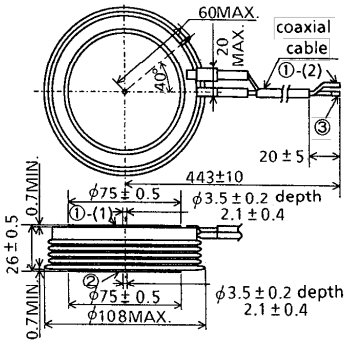
MOTOR CONTROL APPLICATIONS

- All Electric contacts by Pressure Structure and Airtight Package
- Anti-Parallel Fast Recovery Diode in This Package
- Enhancement Mode IGBT

EQUIVALENT CIRCUIT



Unit in mm



①-(1) Emitter
①-(2) aux. Emitter
② Collercter
③ Gate (White)

JEDEC	—
EIAJ	—
TOSHIBA	—

Weight : 1250g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	2500	V
Gate--Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C	1000	A
	1ms	I_{CP}	2000	A
Forward Current	DC	I_F	1000	A
	1ms	I_{FM}	2000	A
Collector Power Dissipation (Tc=25°C)		P_C	5550	W
Operating Junction Temperature		T_j	−20~125	°C
Storage Temperature Range		T_{stg}	−40~125	°C
Mounting Force		—	31.5±3.2	kN

961001EAA1

ELECTRICAL CHARACTERISTICS (Tc = 125°C without R_{th})

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V$, $V_{CE} = 0V$	—	—	±1	μA
Collector Cut-Off Current		I_{CES}	$V_{CE} = 2500V$, $V_{GE} = 0V$	—	—	200	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (off)}$	$V_{CE} = 5V$, $I_C = 1A$	3.0	4.5	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	$I_C = 1000A$, $V_{GE} = 15V$	—	5.5	6.0	V
Input Capacitance		C_{ies}	$V_{CE} = 10V$, $V_{GE} = 0V$, f = 1MHz	—	170	—	nF
Switching Times	Rise Time	t_r	Inductive load, $V_{CC} = 1500V$, $I_C = 1000A$, $V_{GG} = \pm 15V$, $R_G = 5.0\Omega$	—	0.3	—	μs
	Turn-On Time	ton		—	2.2	—	μs
	Fall Time	t_f		—	0.5	—	μs
	Turn-Off Time	t_{off}		—	1.7	—	μs
Forward Voltage of Diode		V_F	$I_F = 1000A$, $V_{GE} = 0V$	—	2.7	3.2	V
Reverse Recovery Time		t_{rr}	$I_F = 1000A$, $V_{GG} = -15V$, $di/dt = 2600A/\mu s$	—	0.6	—	μs
Thermal Resistance	Transistor Pant	$R_{th\ (j\text{-}f)\ E}$	Junction-Emitter side	—	—	47.5	°C / kW
		$R_{th\ (j\text{-}f)\ C}$	Junction-Collector side	—	—	29.0	°C / kW
		$R_{th\ (j\text{-}f)\ D}$	Junction-double side	—	—	18.0	°C / kW
	Diode Part	$R_{th\ (j\text{-}f)\ A}$	Junction-Anode side	—	—	125	°C / kW
		$R_{th\ (j\text{-}f)\ K}$	Junction-Cathode side	—	—	70.3	°C / kW
		$R_{th\ (j\text{-}f)\ D}$	Junction double side	—	—	45.0	°C / kW