



GT2181

Power Audio Transistor

General Description

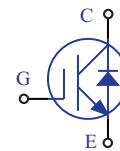
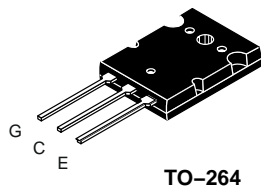
Musitech's Audio series of Insulated Gate Bipolar Transistor provides linearity feature and low conduction losses. The Audio series is designed for applications such as Audio amplifiers where linearity is a required feature.

Features

- Excellent linearity
- Low saturation voltage : $V_{CE(sat)} = 2.5\text{ V @ } I_C = 20\text{A}$
- High input impedance
- CO-PAK, IGBT with FRD : $t_{rr} = 120\text{ns (typ.)}$

Applications

High performance audio systems, Car amplifier, Active Speaker, Sub-woofer.



Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Description	GT2181	Units
V _{CES}	Collector-Emitter Voltage	200	V
V _{GES}	Gate-Emitter Voltage	± 20	V
I _C	Collector Current @ T _C = 25°C	20	A
	Collector Current @ T _C = 100°C	15	A
I _{CM(1)}	Pulsed Collector Current	60	A
I _F	Diode Continuous Forward Current @ T _C = 100°C	15	A
I _{FM}	Diode Maximum Forward Current	60	A
P _D	Maximum Power Dissipation @ T _C = 25°C	180	W
	Maximum Power Dissipation @ T _C = 100°C	78	W
T _J	Operating Junction Temperature	-55 to +150	°C
T _{stg}	Storage Temperature Range	-55 to +150	°C
T _L	Maximum Lead Temp. for Soldering Purposes, 1/8" from Case for 5 Seconds	300	°C

Notes :

(1) Repetitive rating : Pulse width limited by max. junction temperature

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
R _{θJC} (IGBT)	Thermal Resistance, Junction-to-Case	--	0.69	°C/W
R _{θJC} (DIODE)	Thermal Resistance, Junction-to-Case	--	1.1	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	--	40	°C/W



CAUTION: These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

Electrical Characteristics of the IGBT $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 250\mu A$	200	--	--	V
$\Delta B_{V_{CES}} / \Delta T_J$	Temperature Coefficient of Breakdown Voltage	$V_{GE} = 0V, I_C = 1mA$	--	0.23	--	V/ $^\circ\text{C}$
I_{CES}	Collector Cut-Off Current	$V_{CE} = V_{CES}, V_{GE} = 0V$	--	--	250	μA
I_{GES}	G-E Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0V$	--	--	± 100	nA

On Characteristics

$V_{GE(th)}$	G-E Threshold Voltage	$I_C = 10mA, V_{CE} = V_{GE}$	2.5	---	4.0	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C = 10A, V_{GE} = 15V$	--	1.2	2.3	V
		$I_C = 20A, V_{GE} = 15V$	--	2.5	3.8	V

Dynamic Characteristics

C_{ies}	Input Capacitance	$V_{CE} = 20V, V_{GE} = 0V, f = 1MHz$	--	1105	--	pF
C_{oes}	Output Capacitance		--	310	--	pF
C_{res}	Reverse Transfer Capacitance		--	96	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 150V, I_C = 10A, R_G = 10\Omega, V_{GE} = 10V, \text{Inductive Load}, T_C = 25^\circ\text{C}$	--	20	--	ns
t_r	Rise Time		--	68	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	89	--	ns
t_f	Fall Time		--	24	--	ns
E_{on}	Turn-On Switching Loss		--	450	--	μJ
E_{off}	Turn-Off Switching Loss		--	300	--	μJ
E_{ts}	Total Switching Loss	--	190	301	μJ	
$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 150V, I_C = 10A, R_G = 10\Omega, V_{GE} = 10V, \text{Inductive Load}, T_C = 125^\circ\text{C}$	--	32	--	ns
t_r	Rise Time		--	88	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	167	--	ns
t_f	Fall Time		--	91	--	ns
E_{on}	Turn-On Switching Loss		--	560	--	μJ
E_{off}	Turn-Off Switching Loss		--	110	--	μJ
E_{ts}	Total Switching Loss	--	361	580	μJ	
Q_g	Total Gate Charge	$V_{CE} = 150V, I_C = 10A, V_{GE} = 10V$	--	33	--	nC
Q_{ge}	Gate-Emitter Charge		--	8	--	nC
Q_{gc}	Gate-Collector Charge		--	18	--	nC
L_e	Internal Emitter Inductance	Measured 5mm from PKG	--	11	--	nH

Electrical Characteristics of DIODE $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units	
V_{FM}	Diode Forward Voltage	$I_F = 20A$	$T_C = 25^\circ\text{C}$	--	1.2	1.5	V
			$T_C = 100^\circ\text{C}$	--	1.0	--	
t_{rr}	Diode Reverse Recovery Time	$I_F = 20A, di/dt = 200A/\mu s$	$T_C = 25^\circ\text{C}$	--	120	--	ns
			$T_C = 100^\circ\text{C}$	--	210	--	
I_{rr}	Diode Peak Reverse Recovery Current	$I_F = 20A, di/dt = 200A/\mu s$	$T_C = 25^\circ\text{C}$	--	7.4	--	A
			$T_C = 100^\circ\text{C}$	--	9.5	--	
Q_{rr}	Diode Reverse Recovery Charge	$I_F = 20A, di/dt = 200A/\mu s$	$T_C = 25^\circ\text{C}$	--	750	--	nC
			$T_C = 100^\circ\text{C}$	--	1120	--	



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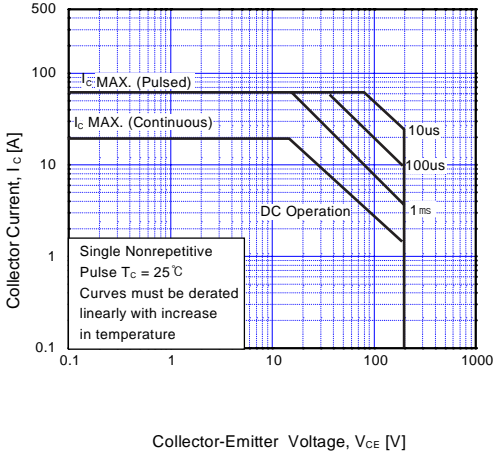


Fig 1. SOA Characteristics

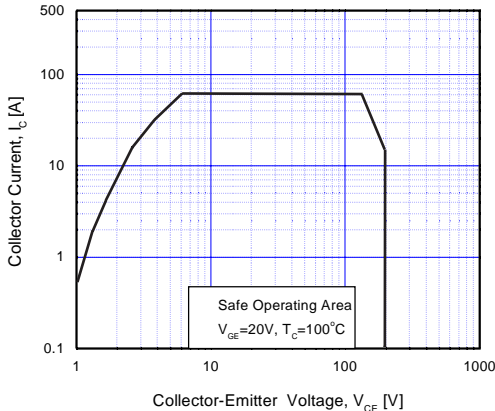


Fig 2. Turn-Off SOA Characteristics

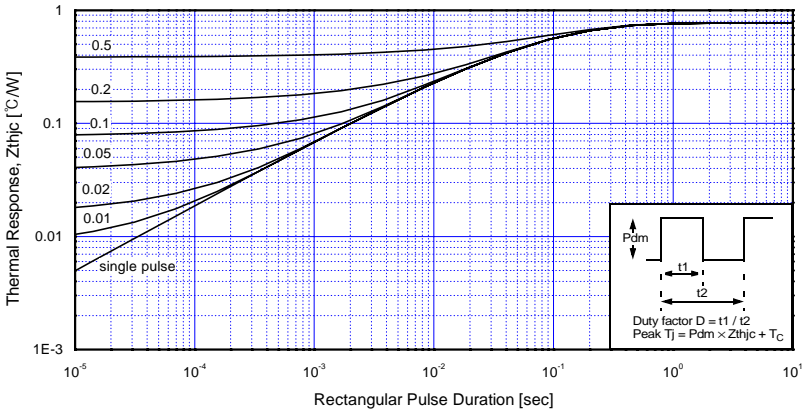


Fig 3. Transient Thermal Impedance of IGBT

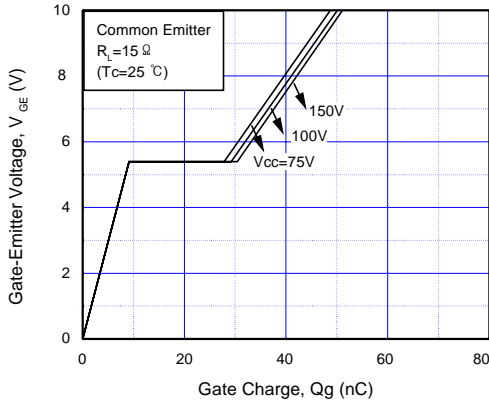
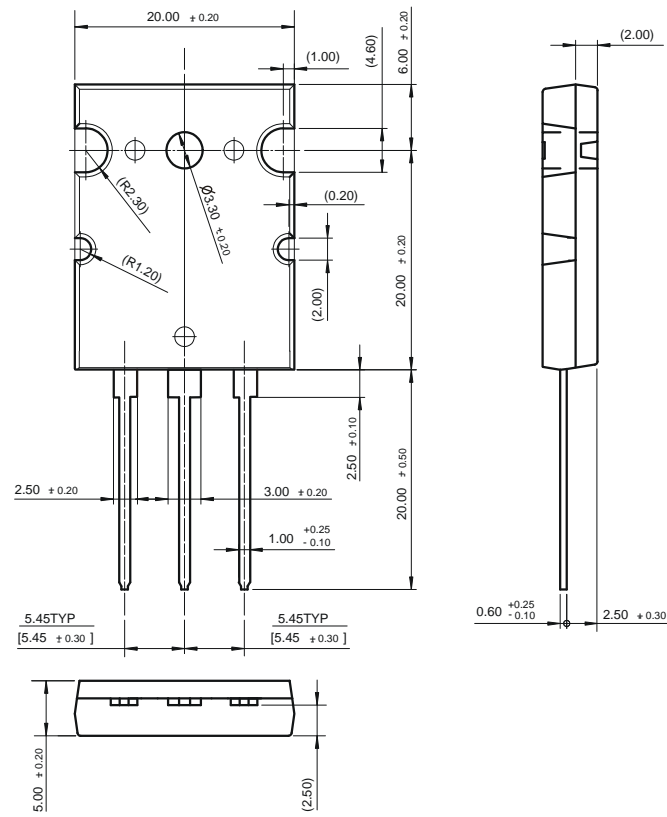


Fig 4. Gate Charge Characteristics

Package Dimensions

TO-264 Package Outline

Unit: mm



Data and specifications subject to change without notice.
 This product has been designed and qualified for the audio amplifiers market.

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