Ordering number : ENA1258

SANYO Semiconductors
DATA SHEET

TIG052TS — N-Channel IGBT
Light-Controlling Flash Applications

Features

- Low-saturation voltage.
- Low voltag drive (2.5V).
- Enhansment type.
- Built-in Gate-to-Emitter protection diode.
- Mounting Height 1.1mm, Mounting Area 19.2mm^2.
- dv / dt guarantee.*

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Emitter Voltage	V_{CES}		400	V
Gate-to-Emitter Voltage (DC)	V_{GES}		±6	V
Gate-to-Emitter Voltage (Pulse)	V_{GES}	PW≤1ms	±8	V
Collector Current (Pulse)	I_{CP}	PW≤500μs, duty cycle≤0.5%, C_M=400μF, V_{GE}=2.5V	150	A
Maximum Collector-to-Emitter dv / dt	dV_{CE} / dt	V_{CE}≤320V, starting Tch=25°C	400	V / μs
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-40 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=2mA, V_{GE}=0V	400			V
Collector-to-Emitter Cutoff Current	I_{CES}	V_{CE}=320V, V_{GE}=0V			10	μA
Gate-to-Emitter Leakage Current	I_{GES}	V_{GE}=±6V, V_{CE}=0V			±10	μA

Marking : G052

Continued on next page.

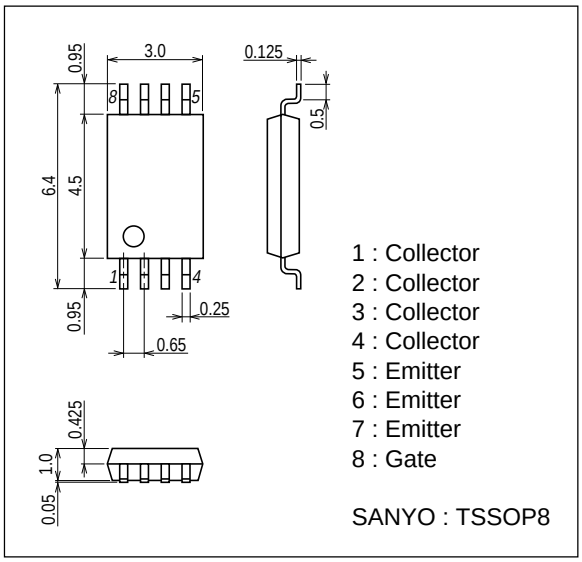
* : Concerning dv/dt (slope of Collector Voltage at the time of Turn-OFF), dv/dt>400v/μs will be 100% screen-detected in the circuit shown as Fig. 1.

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gate-to-Emitter Threshold Voltage	V_{GE}(off)	V_{CE}=10V, I_C=1mA	0.4		1.0	V
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=150A, V_{GE}=2.5V		3.7	5.5	V
Input Capacitance	Cies	V_{CE}=10V, f=1MHz		3800		pF
Output Capacitance	Coes	V_{CE}=10V, f=1MHz		58		pF
Reverse Transfer Capacitance	Cres	V_{CE}=10V, f=1MHz		47		pF

Package Dimensions

unit : mm (typ)
7006A-007



Electrical Connection

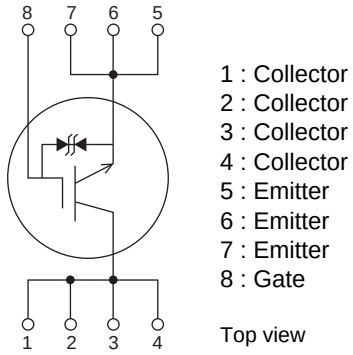
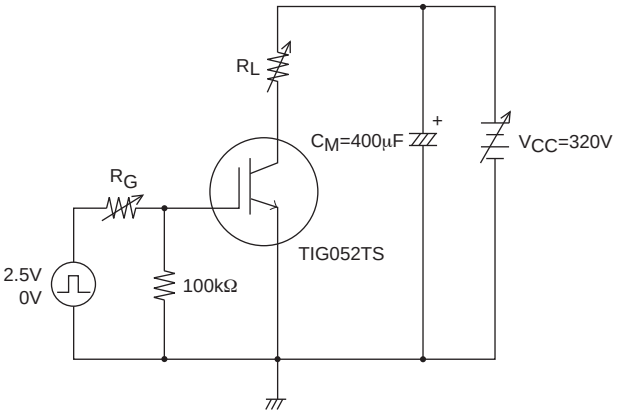
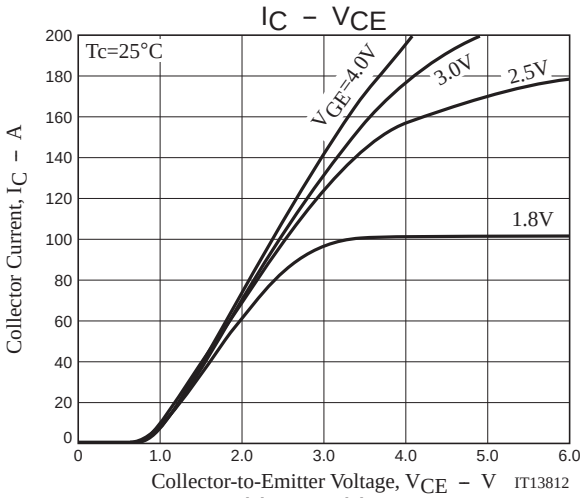
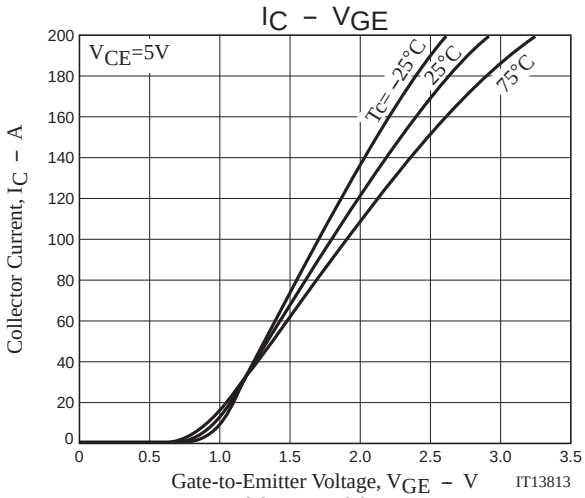


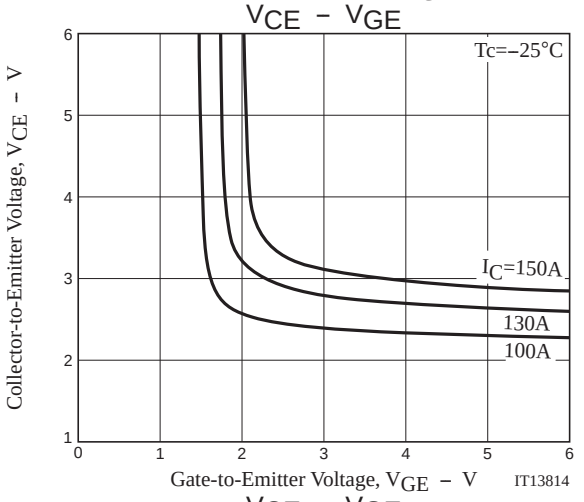
Fig.1 Large Current R Load Switching Circuit

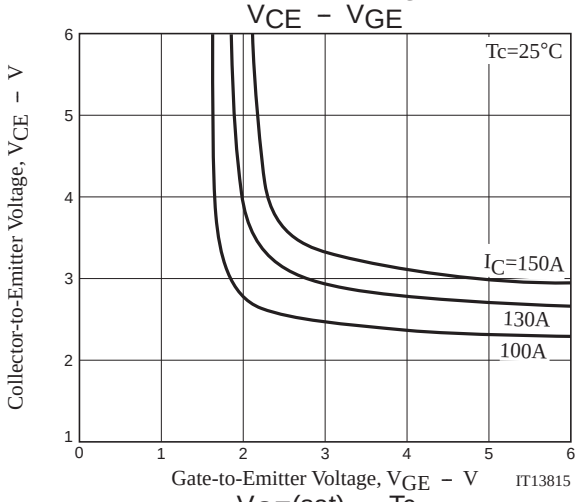


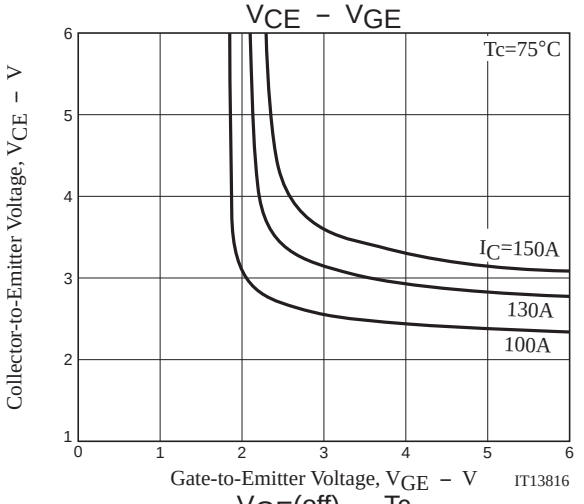
Note1. Gate Series Resistance $R_G \geq 82\Omega$ is recommended for prolection purpose at the time of turn OFF. However, if dv / dt≤400V / μs is satisfied at customer's actual set evaluation, $R_G < 82\Omega$ can also be used.
Note2. The collector voltage gradient dv / dt must be smaller than 400V / μs to protect the device when it is turned off.

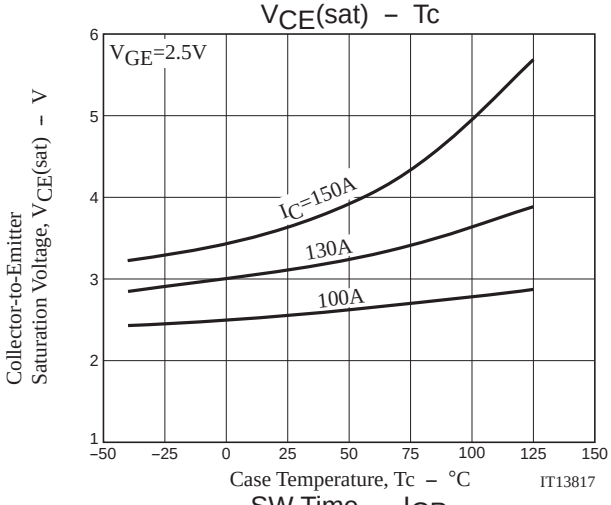

IC – VCE
Tc=25°C
VGE=4.0V
3.0V
2.5V
1.8V
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT13812

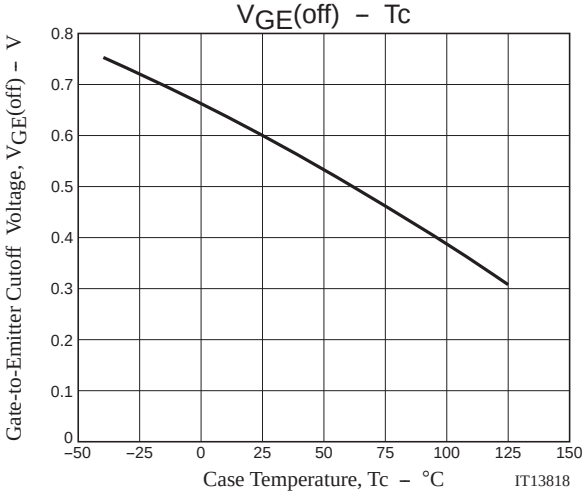

IC – VGE
VCE=5V
Tc=–25°C
25°C
75°C
Collector Current, IC – A
Gate-to-Emitter Voltage, VGE – V
IT13813

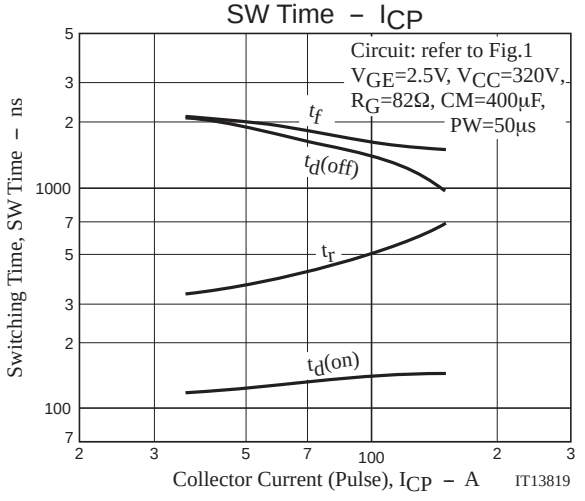

VCE – VGE
Tc=–25°C
IC=150A
130A
100A
Collector-to-Emitter Voltage, VCE – V
Gate-to-Emitter Voltage, VGE – V
IT13814


VCE – VGE
Tc=25°C
IC=150A
130A
100A
Collector-to-Emitter Voltage, VCE – V
Gate-to-Emitter Voltage, VGE – V
IT13815

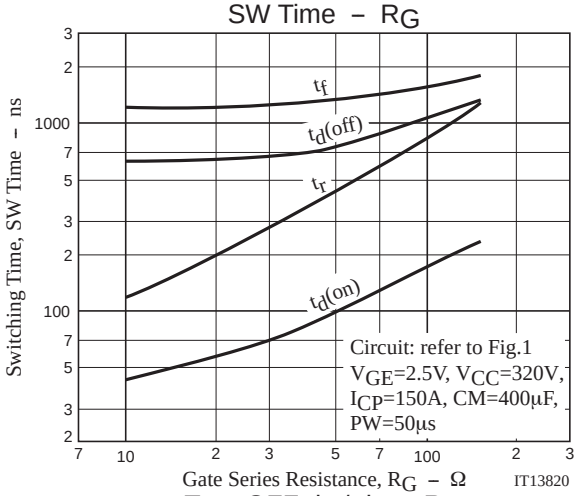

VCE – VGE
Tc=75°C
IC=150A
130A
100A
Collector-to-Emitter Voltage, VCE – V
Gate-to-Emitter Voltage, VGE – V
IT13816


VCE(sat) – Tc
VGE=2.5V
IC=150A
130A
100A
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Case Temperature, Tc – °C
IT13817

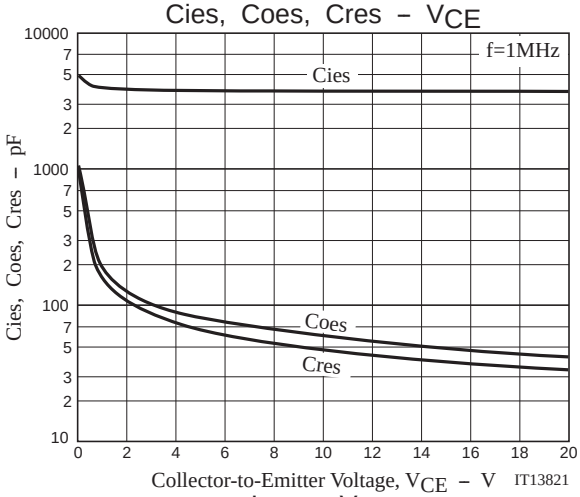

VGE(off) – Tc
Gate-to-Emitter Cutoff Voltage, VGE(off) – V
Case Temperature, Tc – °C
IT13818


SW Time – ICP
Circuit: refer to Fig.1
VGE=2.5V, VCC=320V,
RG=82Ω, CM=400μF,
PW=50μs
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Collector Current (Pulse), ICP – A
IT13819

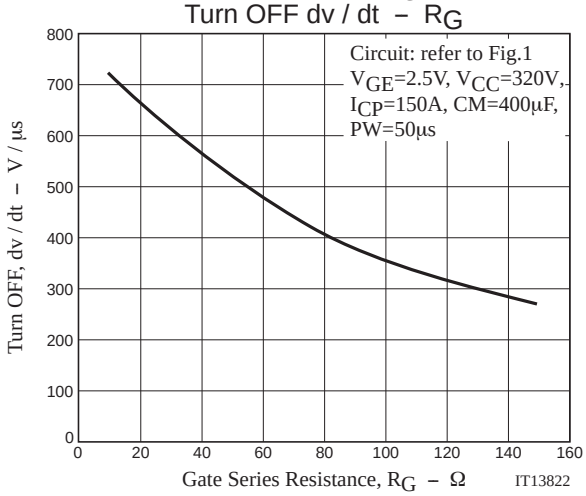
SW Time – R_G



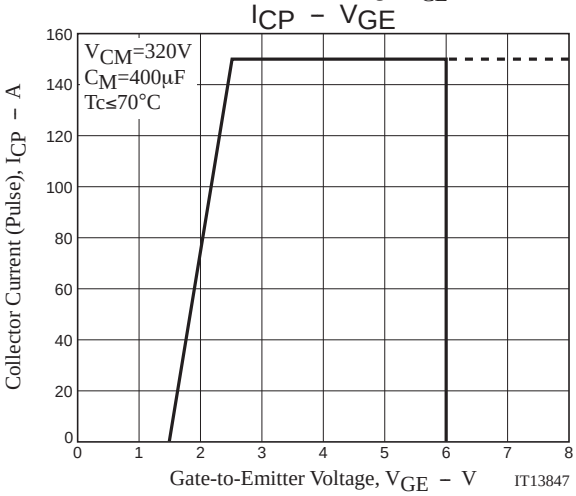
Cies, Coes, Cres – V_{CE}



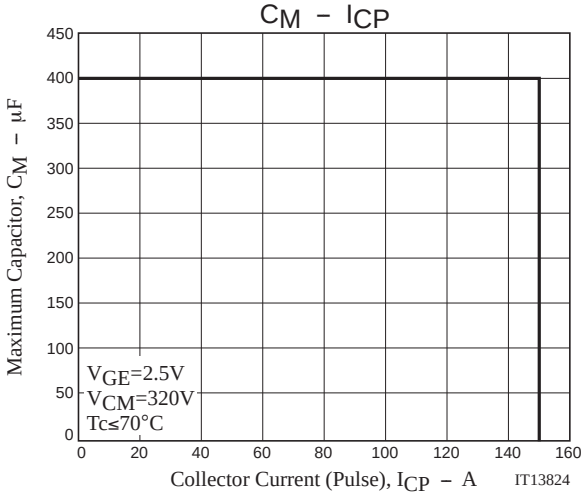
Turn OFF dv / dt – R_G



I_{CP} – V_{GE}



C_M – I_{CP}



Note : TIG052TS has protection diode between gate and emitter but handling it requires sufficient care to be taken.