



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



FGD2N40L 400V N-Channel Logic Level IGBT

Features

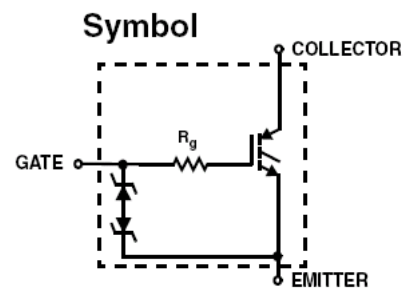
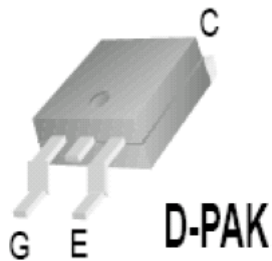
- $V_{CE(SAT)} = 1.6V @ I_C = 2.5A, V_{GE} = 2.4V$
- 6kV ESD Protected
- High Peak Current Density
- TO-252 (D-Pak)
- Low $V_{GE(TH)}$

Applications

- Small Engine Ignition Applications

General Description

This N-Channel IGBT is a MOS gated, logic level device which has been especially tailored for small engine ignition applications. The gate is ESD protected with a zener diode.



Device Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
BV_{CES}	Collector to Emitter Breakdown Voltage	400	V
I_C	Collector Current Continuous(DC)	7	A
I_{CP}	Collector Current Pulsed(100 μs)	29	A
V_{GES}	Gate to Emitter Voltage Continuous(DC)	± 8	V
V_{GEP}	Gate to Emitter Voltage Pulsed	± 10	V
P_D	Power Dissipation Total $T_C = 25^\circ\text{C}$	29	W
T_J	Operating Junction Temperature Range	-40 to 150	$^\circ\text{C}$
T_{STG}	Storage Junction Temperature Range	-40 to 150	$^\circ\text{C}$
ESD	Electrostatic Discharge Voltage at 100pF, 1500 Ω	6	kV

Package Marking and Ordering Information

Device Marking	Device	Package	Tape Width	Quantity
FGD2N40	FGD2N40L	D-PAK	12mm / 16mm	2500

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

Off Characteristics

BV_{CES}	Collector to Emitter Breakdown Voltage	$I_C = 1\text{mA}, V_{GE} = 0\text{V}$	400	-	-	V	
BV_{GES}	Gate-Emitter Breakdown Voltage	$I_{GES} = \pm 1\text{mA}$	± 10	-	-	V	
I_{CES}	Collector to Emitter leakage Current	$V_{CE} = 320\text{V}$	$T_C = +25^\circ\text{C}$	-	-	10	μA
			$T_C = +125^\circ\text{C}$	-	-	250	μA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE} = \pm 8$	-	-	± 10	μA	

On Characteristics

$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	$I_C = 2.5\text{A}, V_{GE} = 2.4\text{V}(\text{NOTE1})$	-	1.3	1.6	V
---------------	---	---	---	-----	-----	---

Dynamic Characteristics

$Q_{G(ON)}$	Gate Charge	$I_C = 2.5\text{A}, V_{CE} = 300\text{V}, V_{GE} = 10\text{V}$	-	11	-	nC
V_{GEP}	Gate to Emitter Plateau Voltage	$I_C = 2.5\text{A}, V_{CE} = 300\text{V}$	-	1.8	-	V
$V_{GE(TH)}$	Gate to Emitter Threshold Voltage	$I_C = 1.0\text{mA}, V_{CE} = V_{GE}$	0.70	0.85	1.2	V
C_{IES}	Input Capacitance	$V_{CE} = 10\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	-	357	-	pF
R_G	Internal Gate Series Resistance			300		ohms

Switching Characteristics

t_{ON}	Turn-On Time	$V_{CC} = 300\text{V}, I_C = 2.5\text{A}, V_{GE} = 4\text{V}, R_L = 120\Omega, R_G = 51\Omega, T_J = 25^\circ\text{C}$	-	0.142	-	μs
$t_{d(ON)I}$	Current Turn-On Delay Time		-	0.047	-	μs
t_{rI}	Current Rise Time		-	0.095	-	μs
t_{OFF}	Turn-Off Time		-	2.152	-	μs
$t_{d(OFF)I}$	Current Turn-Off Delay Time		-	0.650	-	μs
t_{fI}	Current Fall Time		-	1.529	-	μs

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction-Case	TO-252 (D-Pak)	-	-	4.29	$^\circ\text{C/W}$
-----------------	----------------------------------	----------------	---	---	------	--------------------

Notes:

1: Pulse Duration = 100 μsec

Typical Performance Characteristics

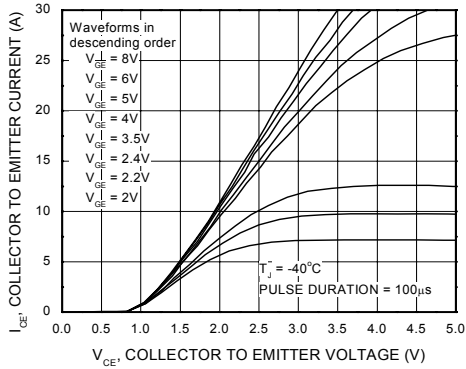


Figure 1. Collector Current Vs. Collector to Emitter On-State Voltage

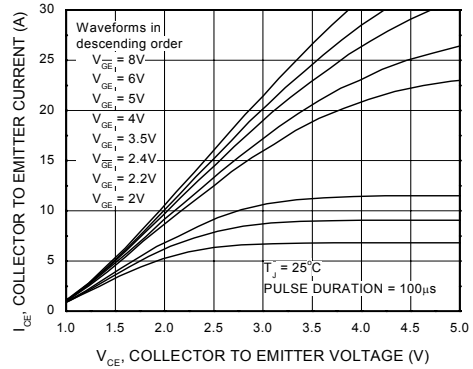


Figure 2. Collector Current Vs. Collector to Emitter On-State Voltage

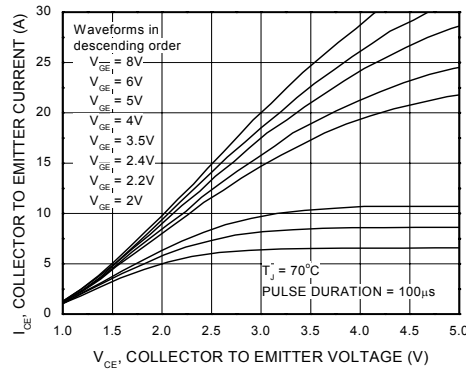


Figure 3. Collector Current Vs. Collector to Emitter On-State Voltage

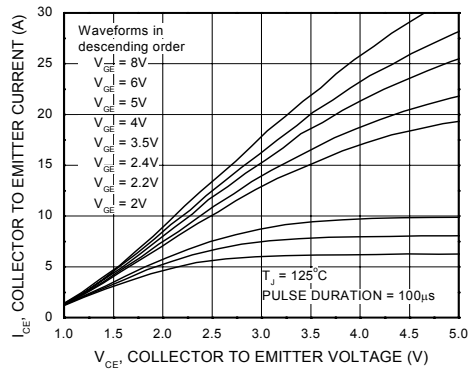


Figure 4. Collector Current Vs. Collector to Emitter On-State Voltage

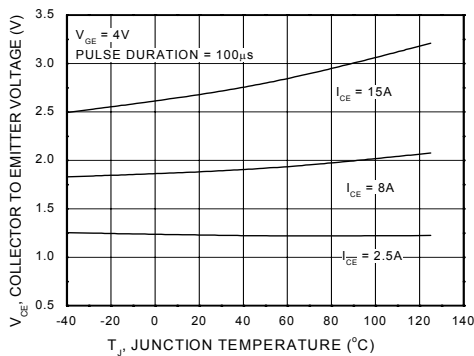


Figure 5. Collector to Emitter Saturation Voltage Vs. Junction Temperature

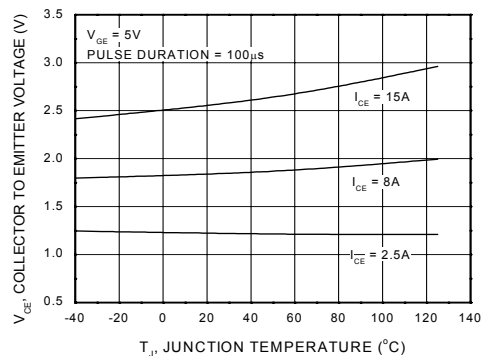


Figure 6. Collector to Emitter Saturation Voltage Vs. Junction Temperature

Typical Performance Characteristics

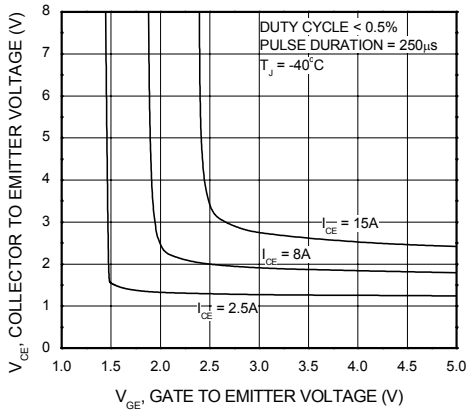


Figure 7. Collector to Emitter On-State Voltage Vs. Gate to Emitter Voltage

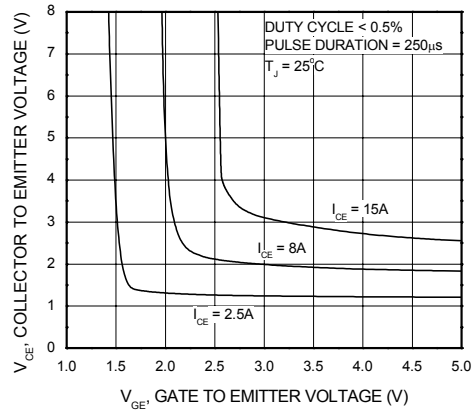


Figure 8. Collector to Emitter On-State Voltage Vs. Gate to Emitter Voltage

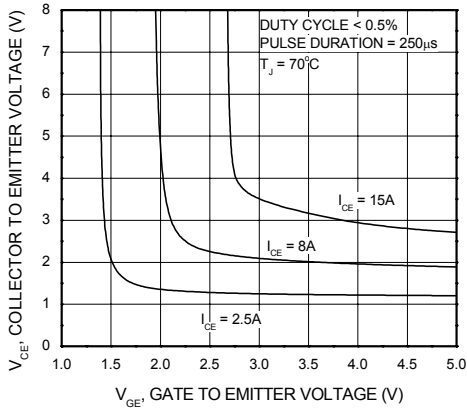


Figure 9. Collector to Emitter On-State Voltage Vs. Gate to Emitter Voltage

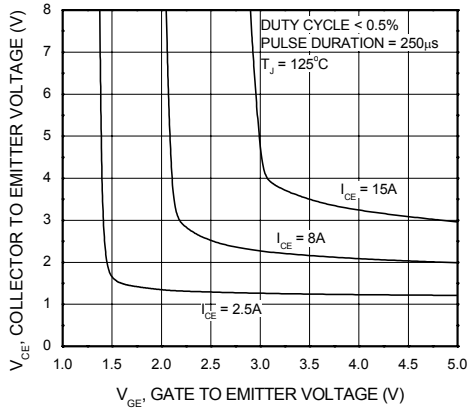


Figure 10. Collector to Emitter On-State Voltage Vs. Gate to Emitter Voltage

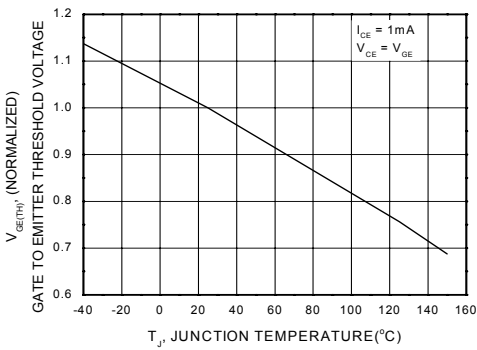


Figure 11. Normalized Gate to Emitter Threshold Voltage Vs. Junction Temperature

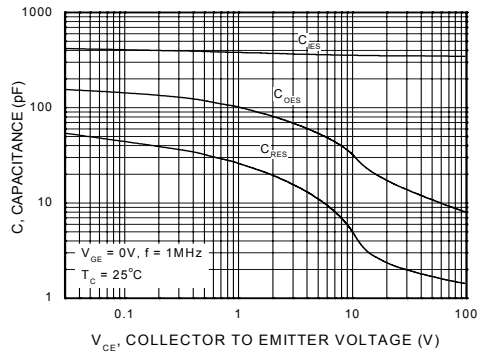


Figure 12. Capacitance Vs. Collector to Emitter Voltage

Typical Performance Characteristics

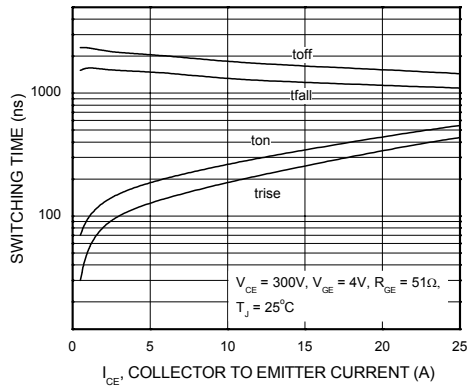


Figure 13. Switching Time Vs. Collector Current

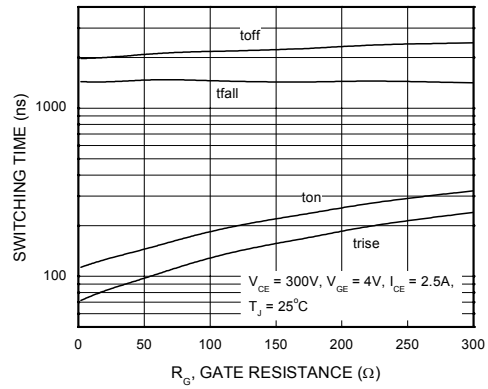


Figure 14. Switching Time Vs. Gate Resistance

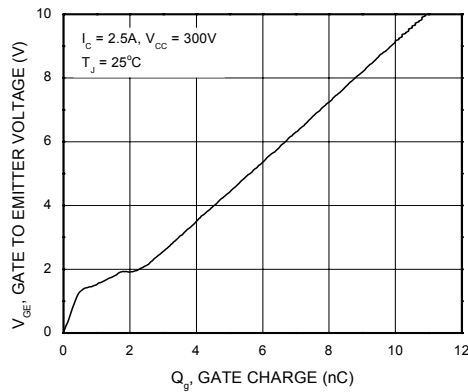


Figure 15. Gate Charge

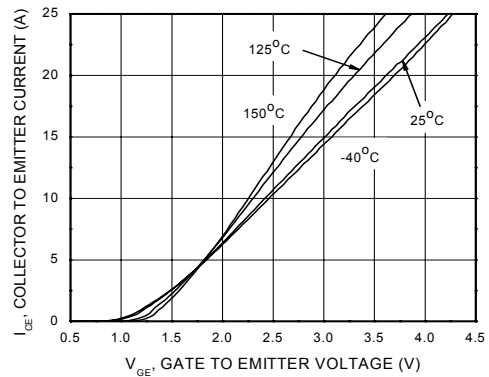


Figure 16. Transfer

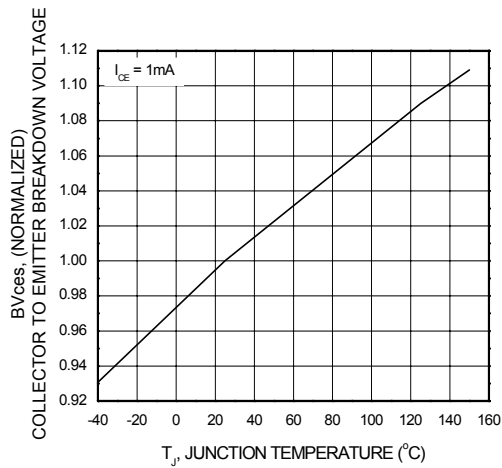


Figure 17. Normalized Collector to Emitter Breakdown Voltage Vs. Junction Temperature

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACE ^x TM	FAST [®]	ISOPLANAR TM	PowerSaver TM	SuperSOT TM -6
ActiveArray TM	FAST ^r TM	LittleFET TM	PowerTrench [®]	SuperSOT TM -8
Bottomless TM	FPS TM	MICROCOUPLER TM	QFET [®]	SyncFET TM
Build it Now TM	FRFET TM	MicroFET TM	QST TM	TCM TM
CoolFET TM	GlobalOptoisolator TM	MicroPak TM	QT Optoelectronics TM	TinyLogic [®]
CROSSVOLT TM	GTO TM	MICROWIRE TM	Quiet Series TM	TINYOPTO TM
DOME TM	HiSeC TM	MSX TM	RapidConfigure TM	TruTranslation TM
EcoSPARK TM	I ² C TM	MSXPro TM	RapidConnect TM	UHC TM
E ² CMOS TM	i-Lo TM	OCX TM	μSerDes TM	UltraFET [®]
EnSigna TM	ImpliedDisconnect TM	OCXPro TM	ScalarPump TM	UniFET TM
FACT TM	IntelliMAX TM	OPTOLOGIC [®]	SILENT	VCX TM
FACT Quiet Series TM		OPTOPLANAR TM	SWITCHER [®]	Wire TM
		PACMAN TM	SMART START TM	
		POP TM	SPM TM	
Across the board. Around the world. TM		Power247 TM	Stealth TM	
The Power Franchise [®]		PowerEdge TM	SuperFET TM	
Programmable Active Droop TM			SuperSOT TM -3	

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

Rev. I18