

IGBT with on-chip Gate-Emitter and Gate-Collector clamps

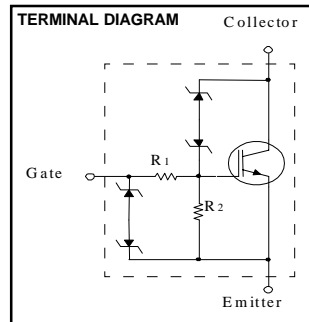
Features

- Most Rugged in Industry
- Logic-Level Gate Drive
- > 6KV ESD Gate Protection
- Low Saturation Voltage
- High Self-clamped Inductive Switching Energy
- Qualified for the Automotive Qualified [Q101] .

NOTES: 1) Part number IRGC14C40LB are die in wafer form probed and uncut; IRGC14C40LC are die on film probed and cut; and IRGC14C40LD are probed die in wafer pack. 2) Reference packaged parts are IRGS14C40L, IRGSL14C40L, and IRGB14C40L.

Description

The advanced IGBT process family includes a MOS gated, N-channel logic level device which is intended for coil-on-plug automotive ignition applications and small-engine ignition circuits. Unique features include on-chip active voltage clamps between the Gate-Emitter and Gate-Collector which provide over voltage protection capability in ignition circuits.



Packaged Characteristics:

- $V_{CES} = 370V \text{ min}, 430V \text{ max}$
- $I_C @ T_C = 110^\circ C = 14A$
- $V_{CE(on)} \text{ typ} = 1.2V @ 7A @ 25^\circ C$
- $I_{L(min)} = 11.5A @ 25^\circ C, L = 4.7mH$

Electrical Characteristics (Wafer Form)

Parameter	Description	Guaranteed (min, max)	Test Conditions @ $T_J = 25^\circ C$
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	2.65V max	$I_C = 10A, V_{GE} = 4.5V$
BV_{CES}	Collector-to-Emitter Breakdown Voltage	370V min, 430V max	$R_G = 1K \text{ ohm}, I_{CES} = 25mA, V_{GE} = 0V$
$V_{GE(th)}$	Gate Threshold Voltage	1.2V min, 2.4V max	$V_{GE} = V_{CE}, I_C = 1mA$
I_{CES}	Zero Gate Voltage Collector Current	10 μA max	$R_G = 1K \text{ ohm}, V_{CE} = 300V$
I_{GES}	Gate-to-Emitter Leakage Current	$\pm 0.32mA \text{ min}, \pm 1mA \text{ max}$	$V_{GE} = +/-10V$
T_J	Operating Junction and Storage	-40 $^\circ C$ to 175 $^\circ C$	
T_{STG}	Temperature Range		

Mechanical Data

Nominal Backmetal Composition, (Thickness)	Cr - Ni/V - Ag, (0.1 μm - 0.2 μm - 0.25 μm)
Nominal Front Metal Composition, (Thickness)	99% Al/1% Si, (4 μm)
Dimensions	0.141" x 0.164"
Wafer Diameter	150mm, with std. < 100 > flat
Wafer Thickness, Tolerance	.015" +/- .003"
Relevant Die Mechanical Dwg. Number	01-5467
Minimum Street Width	100 μm
Reject Ink Dot Size	0.25mm diameter minimum
Ink Dot Location	Consistent throughout same wafer lot
Recommended Storage Environment	Store in original container, in dessicated nitrogen, with no contamination
Recommended Die Attach Conditions	For optimum electrical results, die attach temperature should not exceed 300 $^\circ C$

Die Outline

