N-CHANNEL ENHANCEMENT MODE VERTICAL IGBT

ISSUE 2 – MAY 94

ZCN0545A

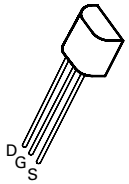
This IGBT combines the high input impedance of the DMOSFET with the high current density of the BJT.

FEATURES

* Extremely low on state voltage
* No need to derate for higher temperatures
* Excellent temperature immunity
* High input impedance
* Reverse blocking characteristic which is Independent of gate bias
* Low input capacitance
* Characterised for logic level drive

APPLICATIONS

* Fluorescent lamp driver
* Automotive load drivers
* High voltage DC-DC converters
* Darlington replacement
* Telecoms hook switch and earth recall switch



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS (at T_{amb}=25°C unless otherwise stated)

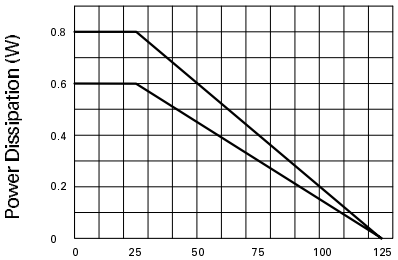
PARAMETER	SYMBOL	VALUE	UNIT
Forward Drain-Source Voltage	V_{DS}	450	V
Reverse Drain Source Voltage	V_{SD}	30	V
Continuous Drain Current	I_D	0.32	A
Practical Continuous Drain Current*	I_{DP}	0.37	A
Pulsed Drain Current @ T_{amb}=25°C @ T_{amb}=125°C	I_{DMR} I_{DM}	2 1	A A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation at T_{amb}=25°C	P_{tot}	0.6	W
Practical Power Dissipation*	P_{DP}	0.8	W
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +125	°C

* With the device mounted in a typical manner on a P.C.B. with at least 1 sq. inch of copper.

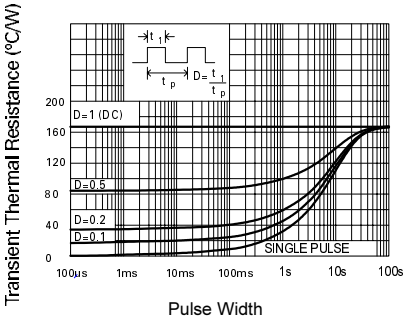
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Forward Drain-Source Breakdown Voltage	BV_{DSS}	450			V	V_{GS}=0V
Reverse Drain-Source Breakdown Voltage (4)	BV_{SD}	30			V	I_D=1mA
Gate-Source Threshold Voltage	$V_{GS(th)}$	1		3	V	ID=1mA, V_{DS}= V_{GS}
Gate-Body Leakage	I_{GSS}			20	nA	V_{GS}=± 20V, V_{DS}=0V
Zero Gate Voltage Drain Current	I_{DSS}			10 400	µA µA	V_{DS}=max. rating, V_{GS}=0 V_{DS}=0.8 x max. rating, V_{GS}=0V, T=125°C (2)
Drain Source Saturation Voltage (1)	$V_{DS(SAT)}$			3 3	V V	I_D=500mA, V_{GS}=10 V I_D=250mA, V_{GS}=5 V
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			6	Ω	V_{GS}=10V,I_D=0.5A
Input Capacitance (2)	C_{iss}			90	pF	V_{DS}=25 V, V_{GS}=0V, f=1MHz
Common Source Output Capacitance (2)	C_{oss}			12	pF	
Reverse Transfer Capacitance (2)	C_{rss}			6	pF	
Switching Times (2)(3)	t_{on}			150	ns	V_{DD}≈25V, V_{GEN}=10V I_D=1A, R_{GS}=50Ω
	t_{off}		200	300	ns	

(1) Measured under pulsed conditions. Width=300µs. Duty cycle ≤2% (2) Sample test.
(3) Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator
(4) One minute maximum duration. Exceeds common international automotive reverse battery test specifications



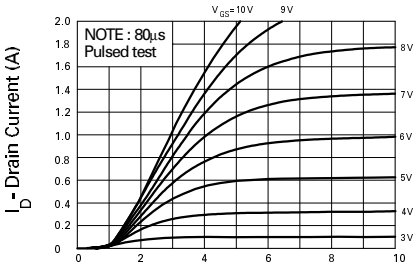
Derating Curve



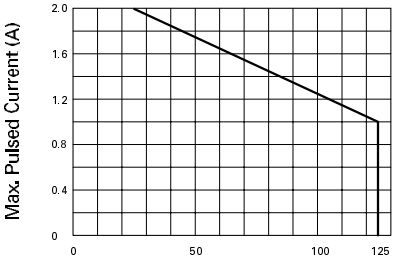
Transient Thermal Resistance

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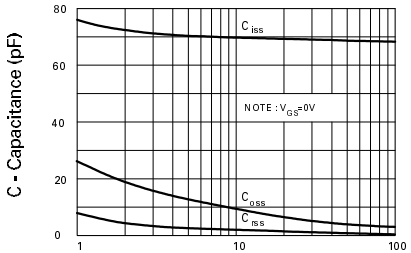
TYPICAL CHARACTERISTICS



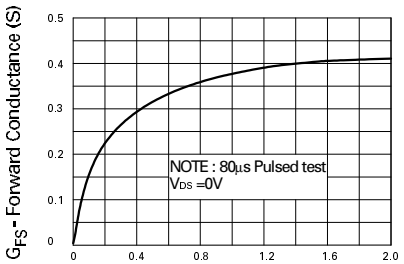
Saturation Characteristics



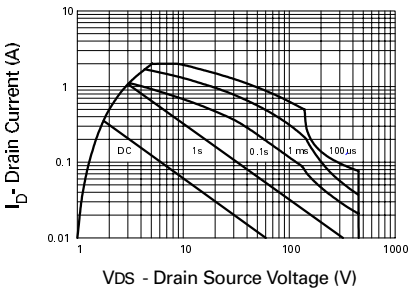
Pulsed Current v Temperature



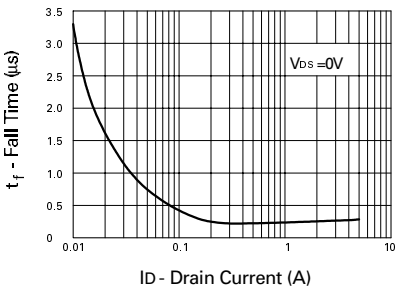
Capacitance v Drain Source Voltage



Transconductance v Drain Current



Safe Operating Area
(Tamb=25°C, single pulse)



Fall Time v Drain Current