ITC14415006D

POWERLINE N-CHANNEL IGBT CHIP

FEATURES

- n - Channel.
- Enhancement Mode.
- High Input Impedance.
- High Switching Speed.
- Latch-Free Operation.
- Low Forward Voltage Drop.
- Short Circuit Capability (10µs).

TYPICAL KEY PARAMETERS (25˚C)

V_{CES}	600V
$I_{C(CONT)}$	150A
$V_{CE(sat)}$	2.3V

RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
V_{CES}	Collector-emitter voltage	V_{GE} = 0V	600	V
V_{GE}	Gate-emitter voltage	-	±20	V
$I_{C(CONT)}$	Continuous collector current	-	150	A
$I_{C(PK)}$	Peak collector current	t_p = 1ms	300	A

STATIC ELECTRICAL CHARACTERISTICS

Measured under pulse conditions T_{case} = 25˚C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
I_{CES}	Collector cut-off current	V_{GE} = 0V, V_{CE} = V_{CES}		-	-	1	mA
I_{GES}	Gate leakage current	V_{GE} = ±20V		-	-	±500	nA
$V_{GE(TH)}$	Gate threshold voltage	I_C = 5mA, V_{CE} = V_{GE}		4.0	-	7.5	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C = 150A, V_{GE} = 15V	T_j = 25˚C	-	2.3	3.0	V
			T_j = 125˚C	-	2.6	3.3	V
		I_C = 300A, V_{GE} = 15V	T_j = 25˚C	-	3.5	4.6	V
			T_j = 125˚C	-	4.3	5.5	V

All ratings given assuming suitable mountdown of chip.

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
C_{ies}	Input capacitance	V_{GE} = 0V, V_{CE} = 25V, f = 1MHz, T_{case} = 25˚C	-	14500	-	pF
C_{oes}	Output capacitance	V_{GE} = 0V, V_{CE} = 25V, f = 1MHz, T_{case} = 25˚C	-	2200	-	pF
C_{res}	Reverse transfer capacitance	V_{GE} = 0V, V_{CE} = 25V, f = 1MHz, T_{case} = 25˚C	-	2100	-	pF

INDUCTIVE SWITCHING CHARACTERISTICS

T_{case} = 125˚C unless stated otherwise.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
$t_{d(off)}$	Turn-off delay time	Inductive load I_C = 150A V_{CE} = 50% V_{CES}, V_{GE} = ±15V, R_G = 6.6Ω	-	560	-	ns
t_f	Fall time		-	430	-	ns
E_{OFF}	Turn-off energy loss		-	14	-	mJ
$t_{d(on)}$	Turn-on delay time		-	810	-	ns
t_r	Rise time		-	290	-	ns
E_{ON}	Turn-on energy loss		-	12	-	mJ

THERMAL CHARACTERISTICS

Symbol	Parameter	Conditions	Max.	Units
T_j	Junction temperature	-	150	˚C
T_{stg}	Storage temperature	-	-55 to +150	˚C

All ratings given assuming suitable mountdown of chip.

CURVES

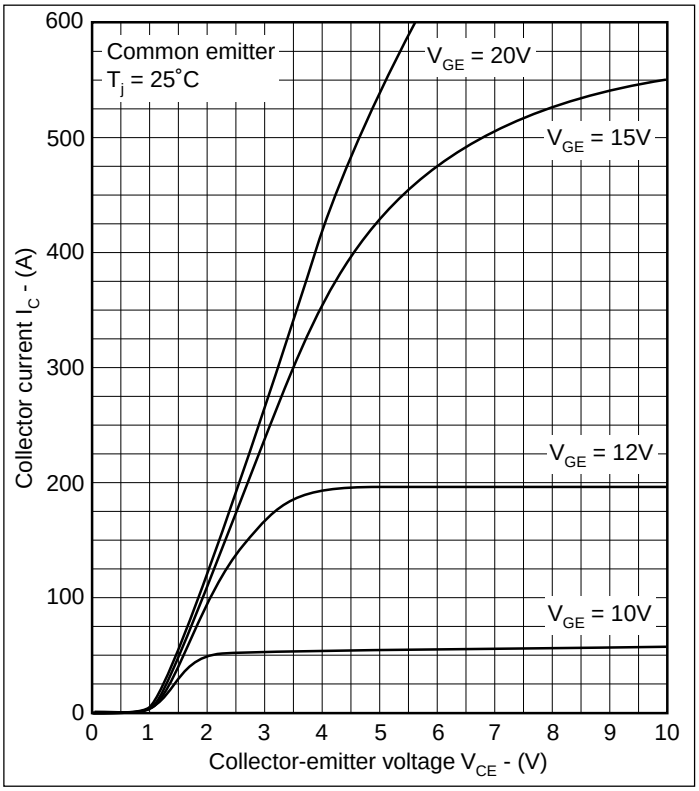

Fig.1 Typical output characteristics @ 25˚C

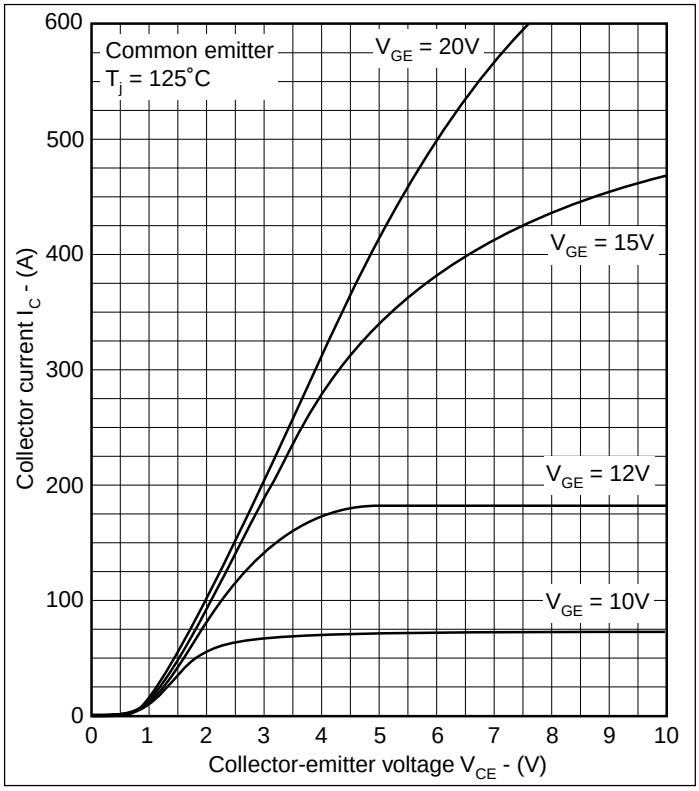

Fig.2 Typical output characteristics @ 125˚C

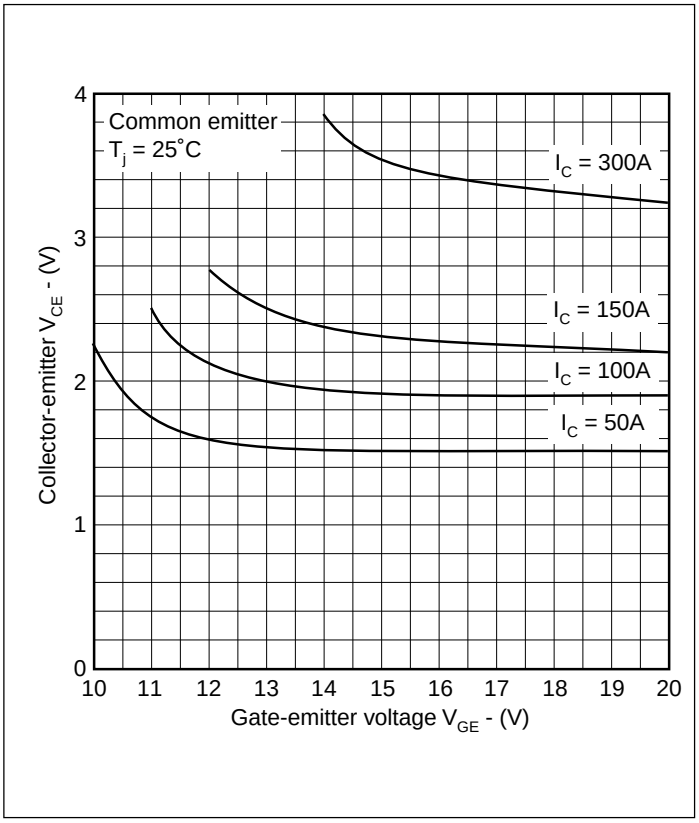

Fig.3 Typical transfer characteristics @ 25˚C

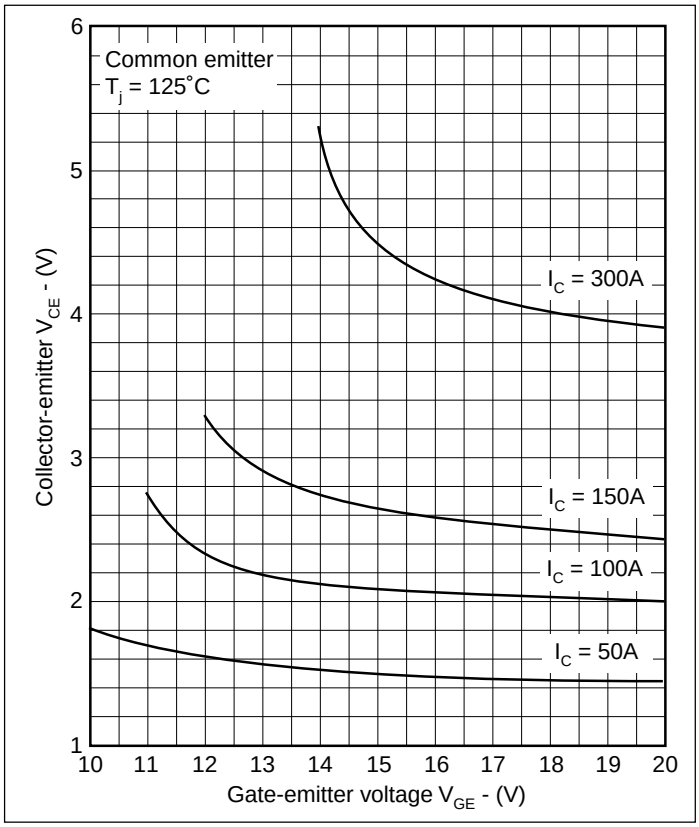

Fig.4 Typical transfer characteristics @ 125˚C

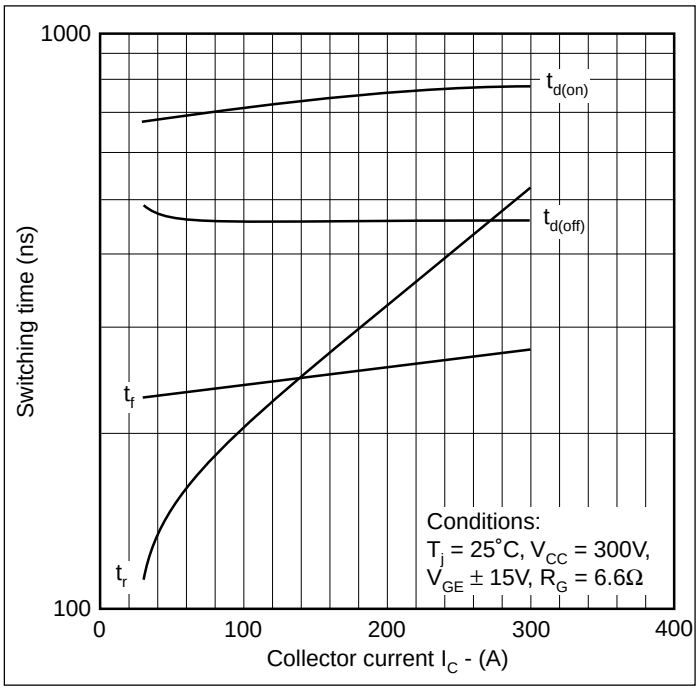

Fig.5 Typical switching time vs I_C @ 25˚C

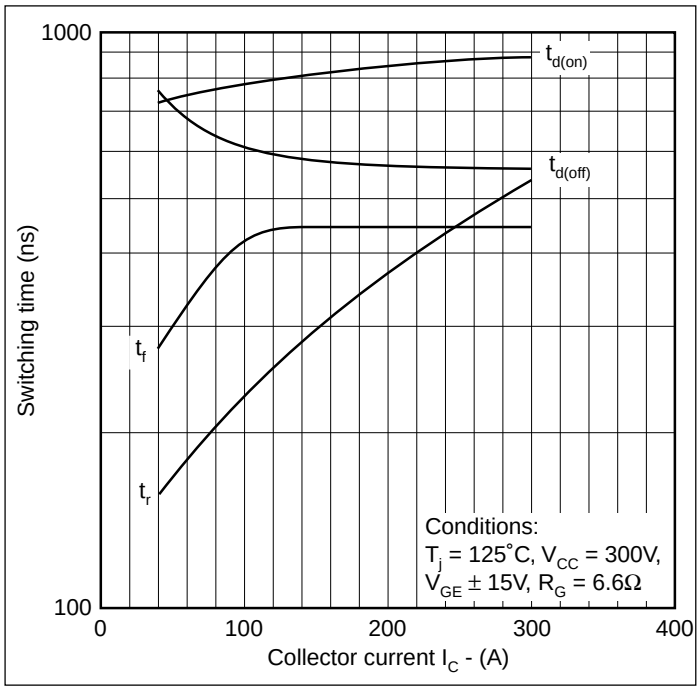

Fig.6 Typical switching time vs I_C @ 125˚C

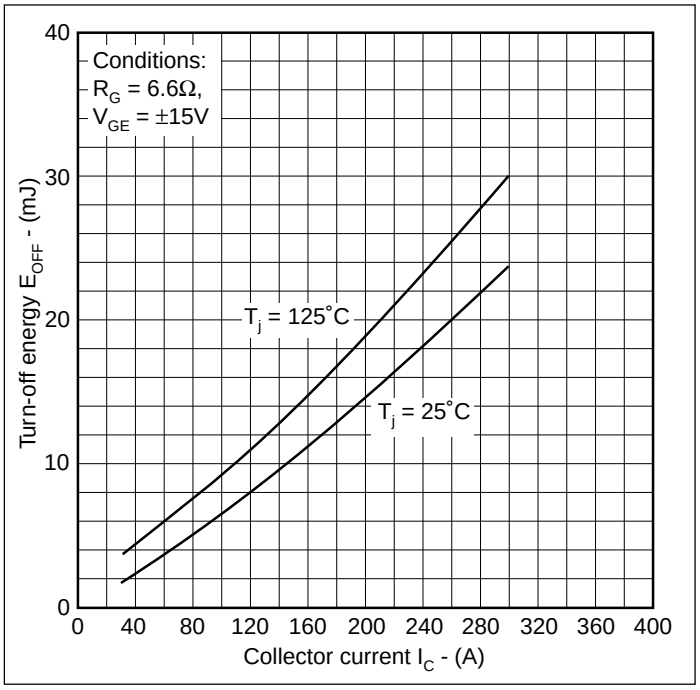

Fig.7 Typical turn-off losses

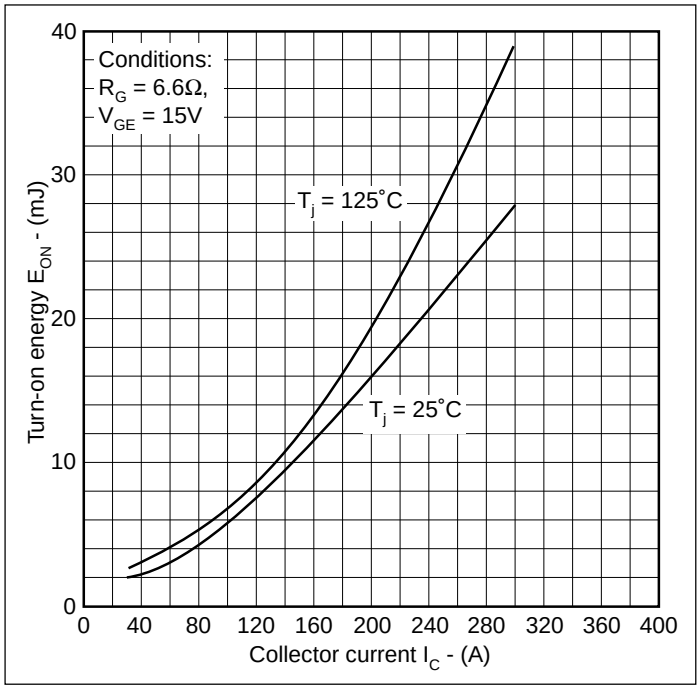

Fig.8 Typical turn-on losses

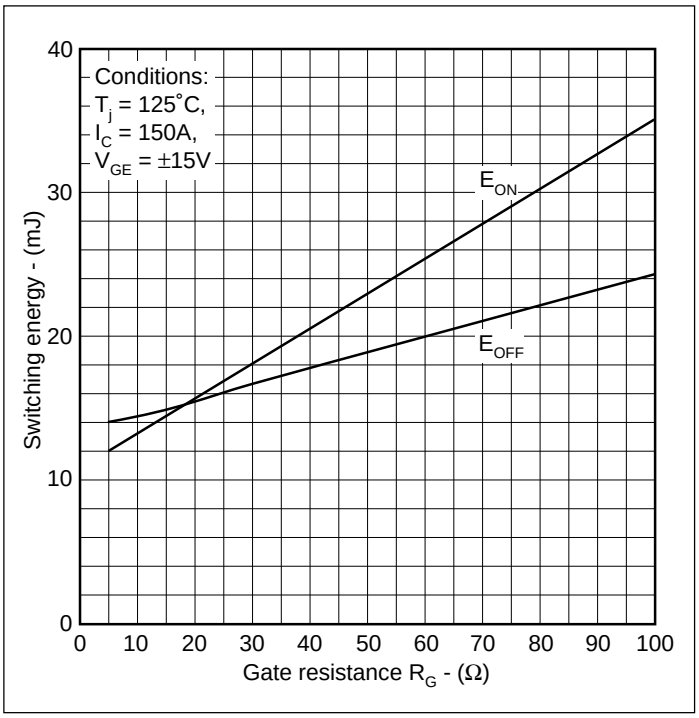

Fig.9 Typical switching energy

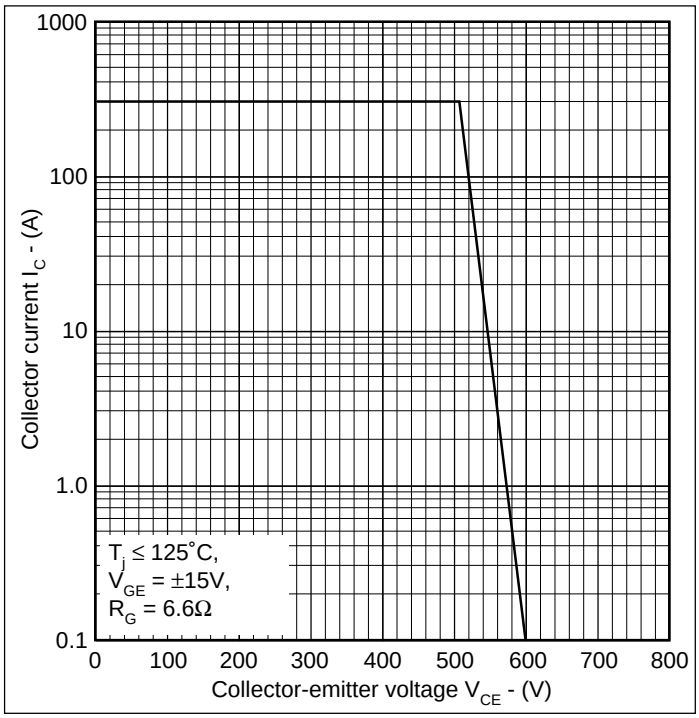

Fig.10 Reverse bias safe operating area

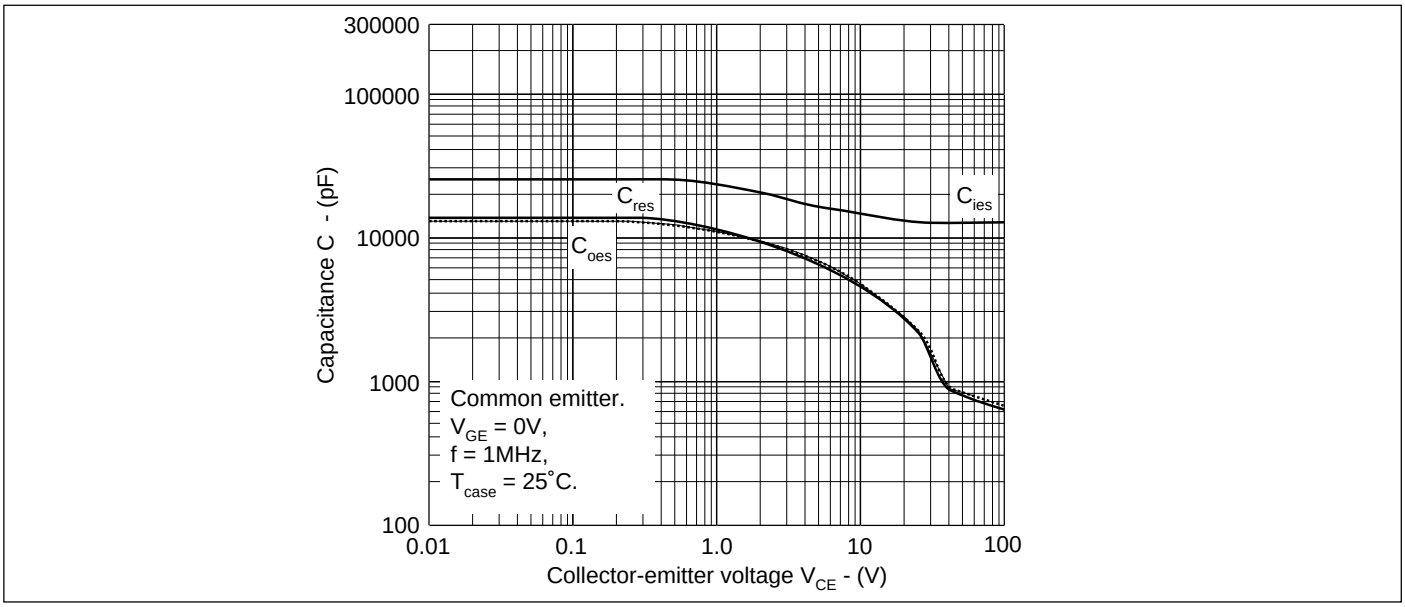

Fig.11 Typical capacitance

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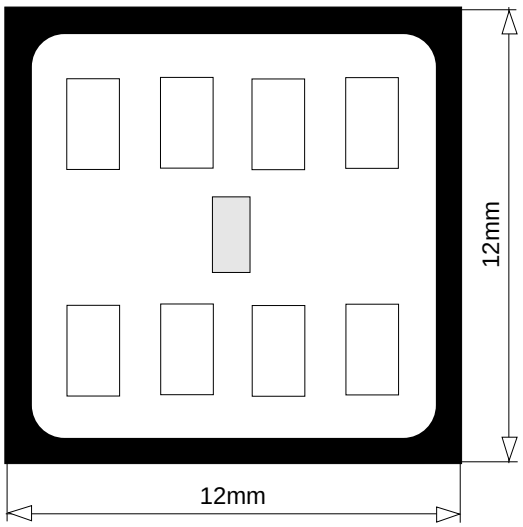
CHIP DETAILS

All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Typical chip thickness: 537µm.

Wire sizes: 10 bondwires ≥ 300µm Ø.

Composition of wire: 99.999% Aluminium.

Back metal: Aluminium, Titanium, Nickel, Silver.

T_{max} for chip **NOT** to exceed 275˚C for more than 15 minutes during soldering, using 96S solder.

Packing for shipment is either membrane or waffle tray.

Static sensitive device - observe static handling precautions.

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 Publication No. DS4393-2 Issue No. 2.6 July 1996