ShinDengen

P85GC28HP2F

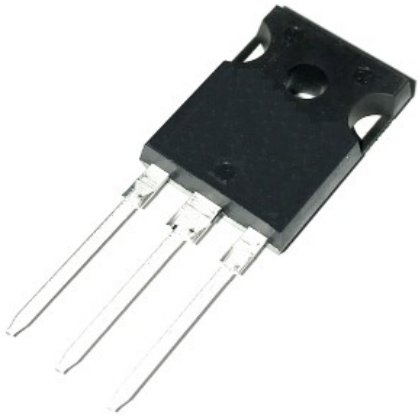
Power MOSFETs
280V, 85A, N-channel

Feature

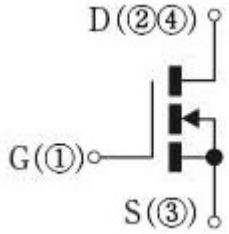
- N-channel
- High Voltage
- High Speed Switching
- Low Ron
- Low Capacitance
- Halogen free
- Pb free terminal
- RoHS:Yes

OUTLINE

Package (House Name): GC
Package (JEDEC Code): TO-247AD



Equivalent circuit



Absolute Maximum Ratings (unless otherwise specified : Tc=25℃)

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 150	℃
Channel tempertature	Tch		-55 to 150	℃
Drain-source voltage	V_{DSS}		280	V
Gate-source voltage	V_{GSS}		±30	V
Continuous drain current(DC)	I_D		85	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, Duty=1/100	340	A
Continuous source current(DC)	Is		85	A
Total power dissipation	P_T	With heatsink	430	W
Repetitive avalanche current	I_{AR}	Starting Tch=25℃ Tch≦150℃	50	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	240	mJ
Repetitive avalanche energy	E_{AR}	Starting Tch=25℃ Tch≦150℃	24	mJ
Drain-source diode di/dt strength	di/dt	Is=85A, Tc=25℃	350	A/μs
Mounting torque	TOR	(Recommended torque：0.5N･m)	0.8	N･m

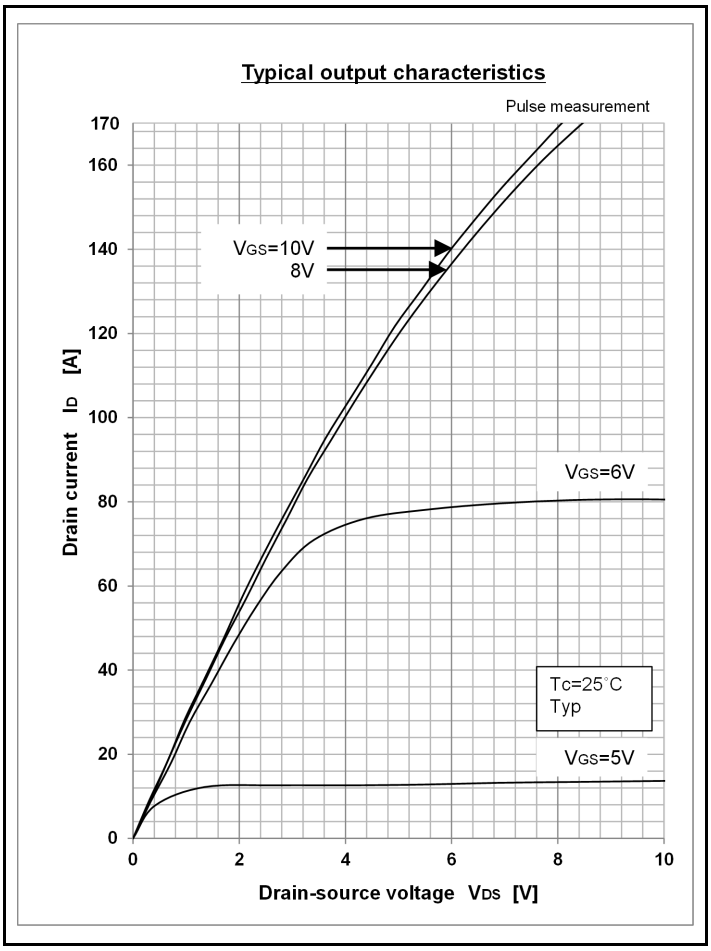
※ ：See the original Specifications

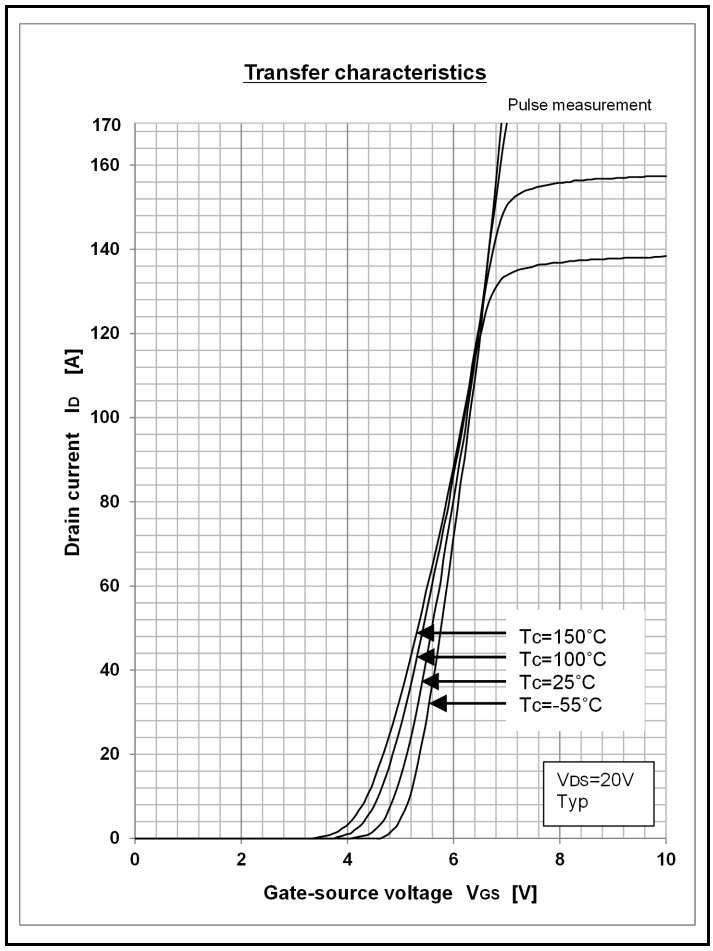
Electrical Characteristics (unless otherwise specified : Tc=25℃)

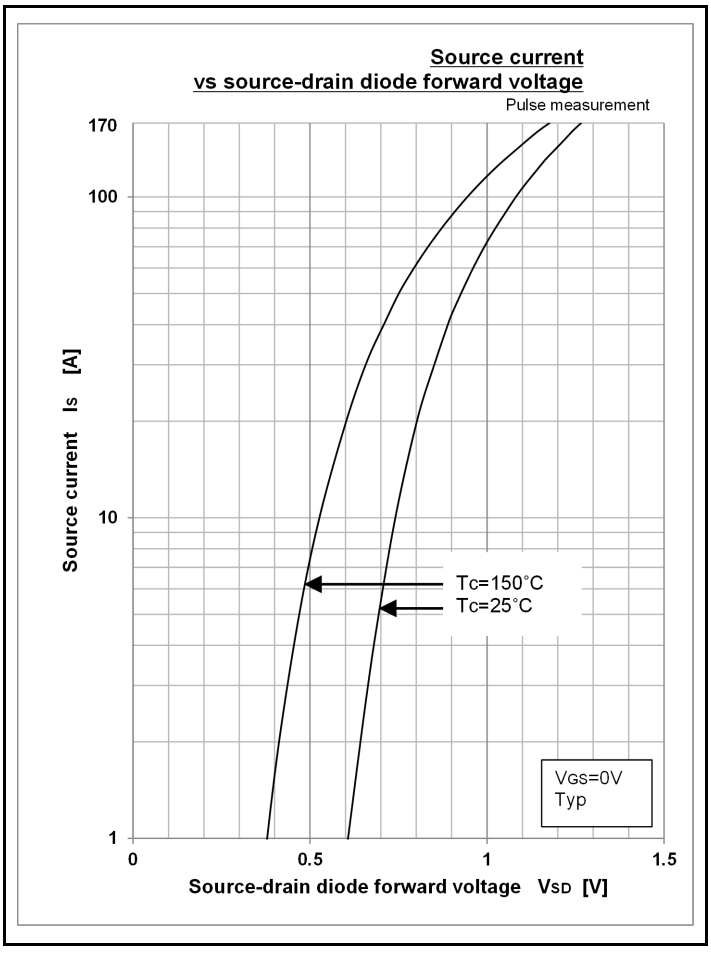
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	280			V
Zero gate voltage drain current	I_{DSS}	VDS=280V, VGS=0V			100	μA
Gate-source leakage current	I_{GSS}	VGS=±30V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=42.5A, VDS=10V	32.5	65		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=42.5A, VGS=10V		0.035	0.045	Ω
Gate threshold voltage	Vth	ID=3mA, VDS=10V	2		4.5	V
Source-drain diode forward voltage	V_{SD}	IS=42.5A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink			0.29	℃/W
Total gate charge	Qg	VDS=200V, VGS=10V, ID=85A		110		nC
Input capacitance	Ciss	VDS=50V, VGS=0V, f=1MHz		4375		pF
Reverce transfer capacitnce	Crss	VDS=50V, VGS=0V, f=1MHz		42		pF
Output capacitance	Coss	VDS=50V, VGS=0V, f=1MHz		665		pF
Turn-on delay time	td(on)	ID=42.5A, RL=3.53Ω, VDS=150V, Rg=50Ω, +VGS=10V, -VGS=0V		100		ns
Rise time	tr	ID=42.5A, RL=3.53Ω, VDS=150V, Rg=50Ω, +VGS=10V, -VGS=0V		246		ns
Turn-off delay time	td(off)	ID=42.5A, RL=3.53Ω, VDS=150V, Rg=50Ω, +VGS=10V, -VGS=0V		424		ns
Fall time	tf	ID=42.5A, RL=3.53Ω, VDS=150V, Rg=50Ω, +VGS=10V, -VGS=0V		200		ns
Diode reverse recovery time	trr	IS=85A, VGS=0V, -di/dt=100A/μs		83		ns
Diode reverse recovery charge	Qrr	IS=85A, VGS=0V, -di/dt=100A/μs		210		nC

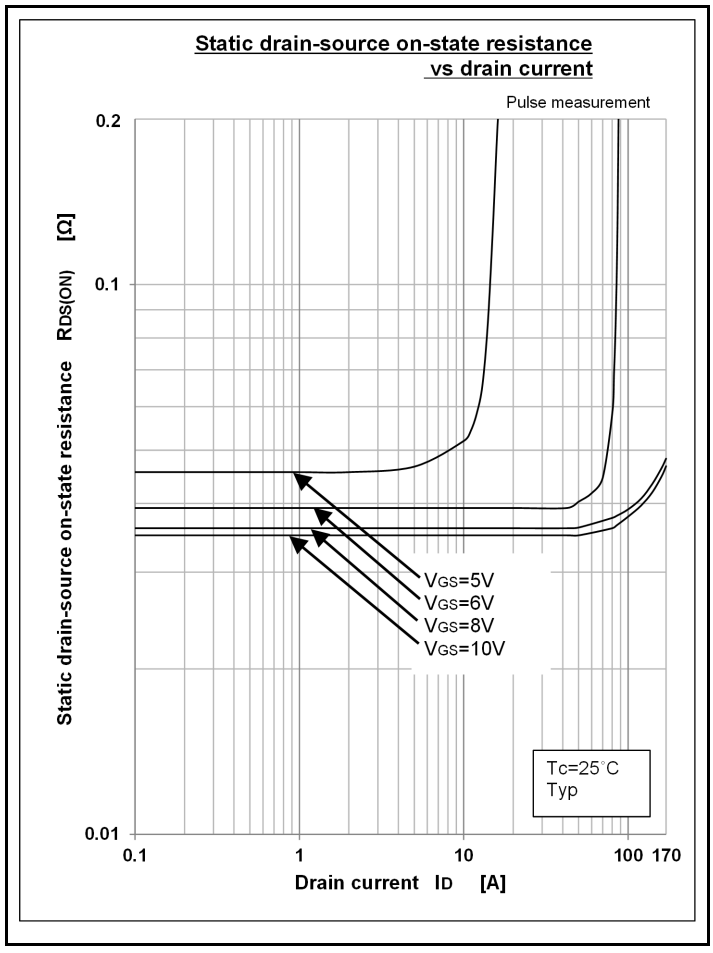
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

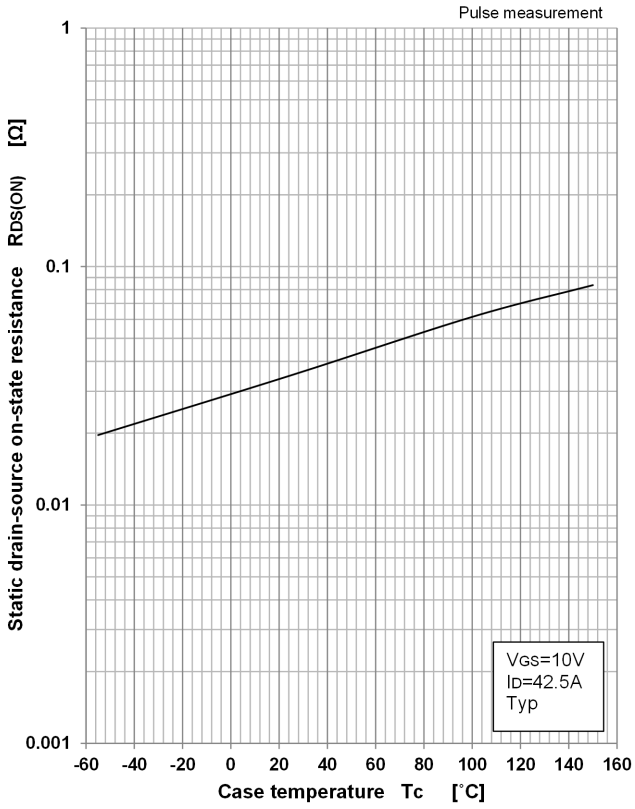




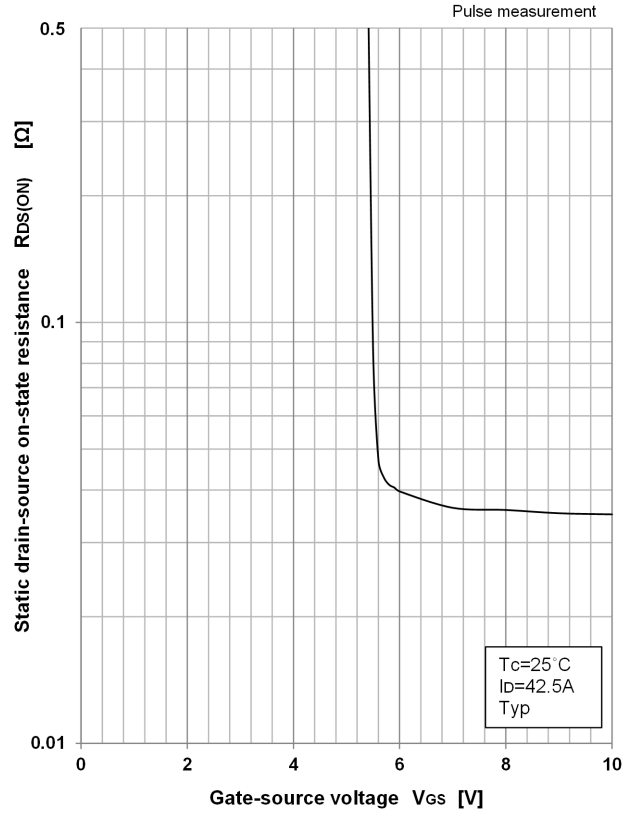




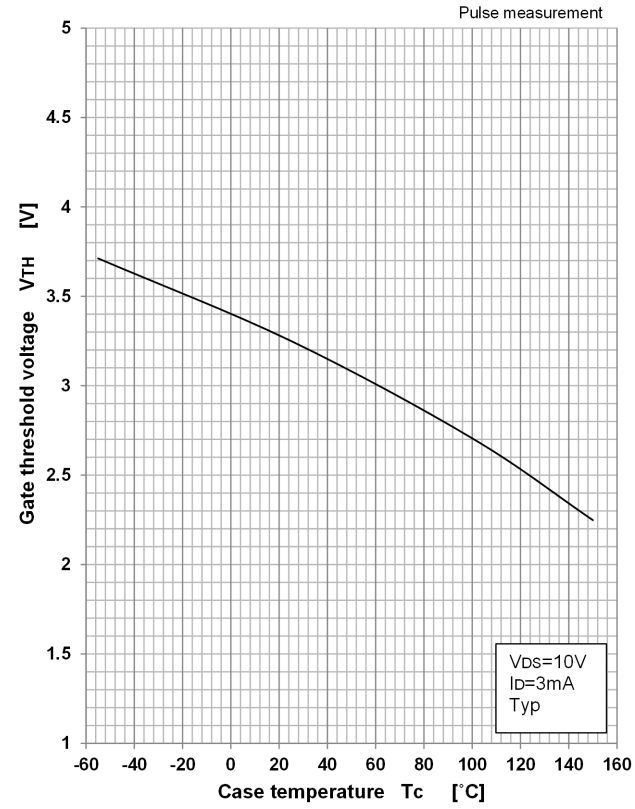
Static drain-source on-state resistance vs case temperature



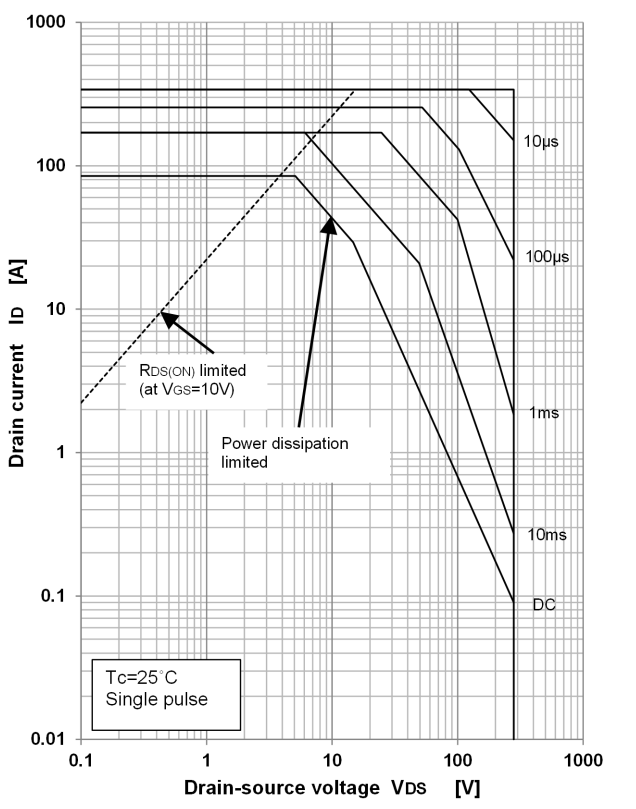
Static drain-source on-state resistance vs gate-source voltage

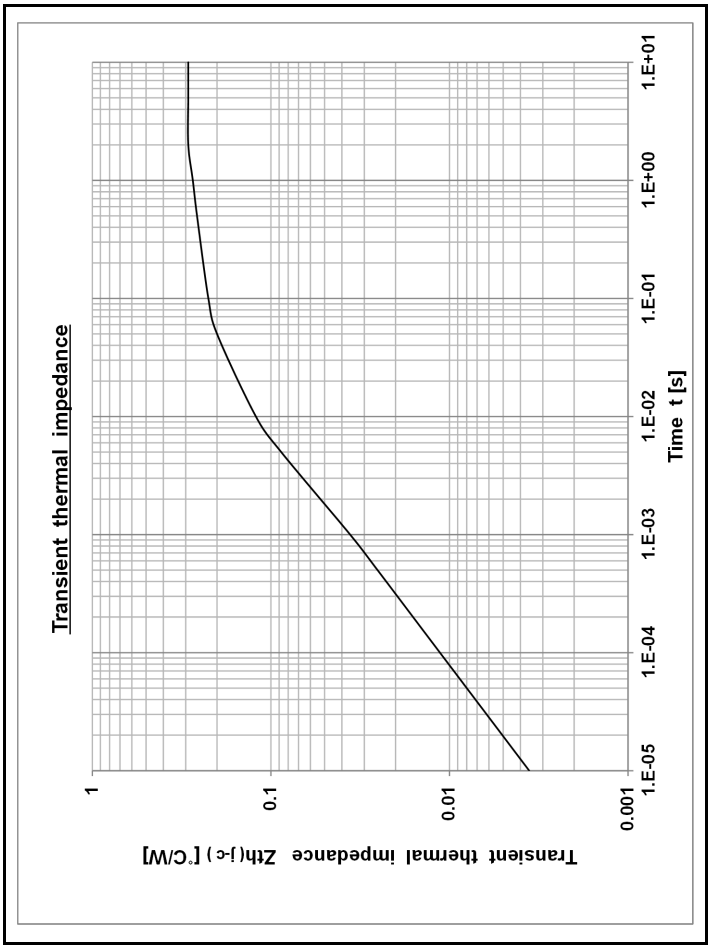


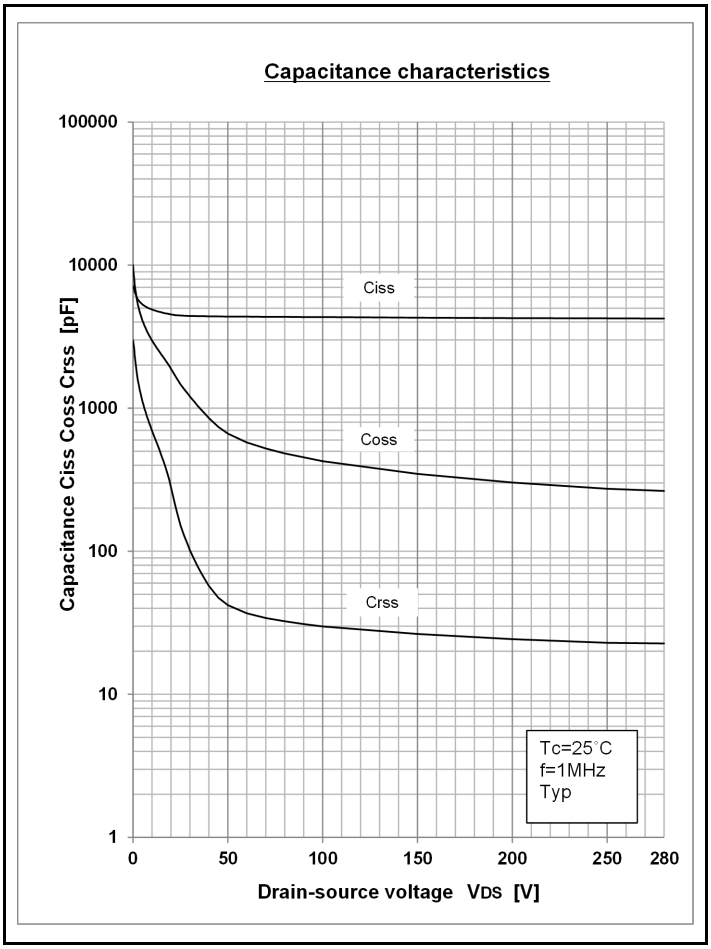
Gate threshold voltage vs case temperature

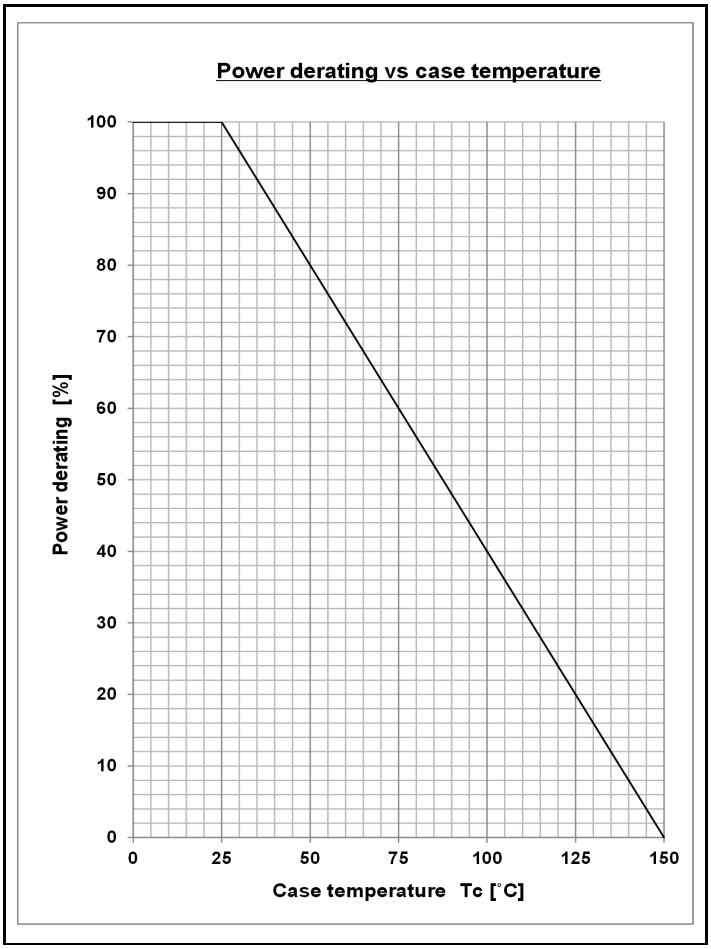


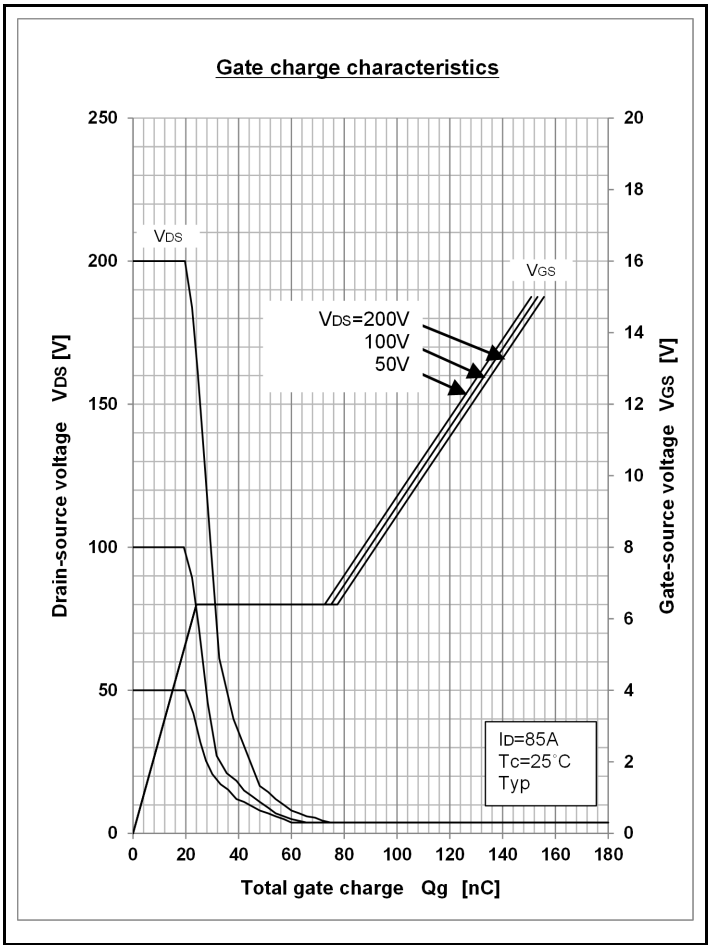
Safe operating area

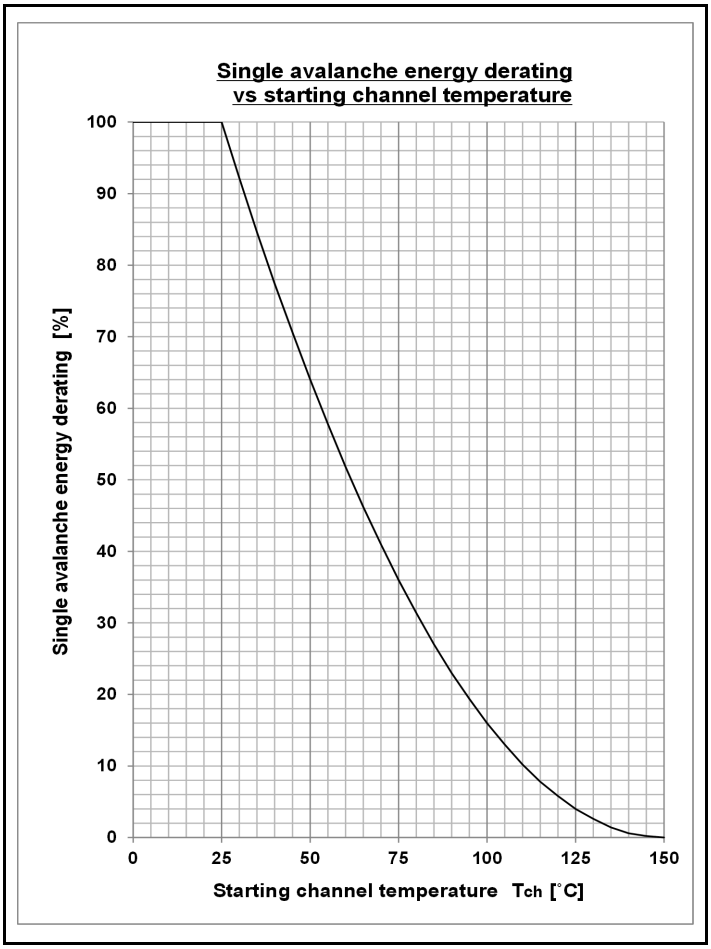


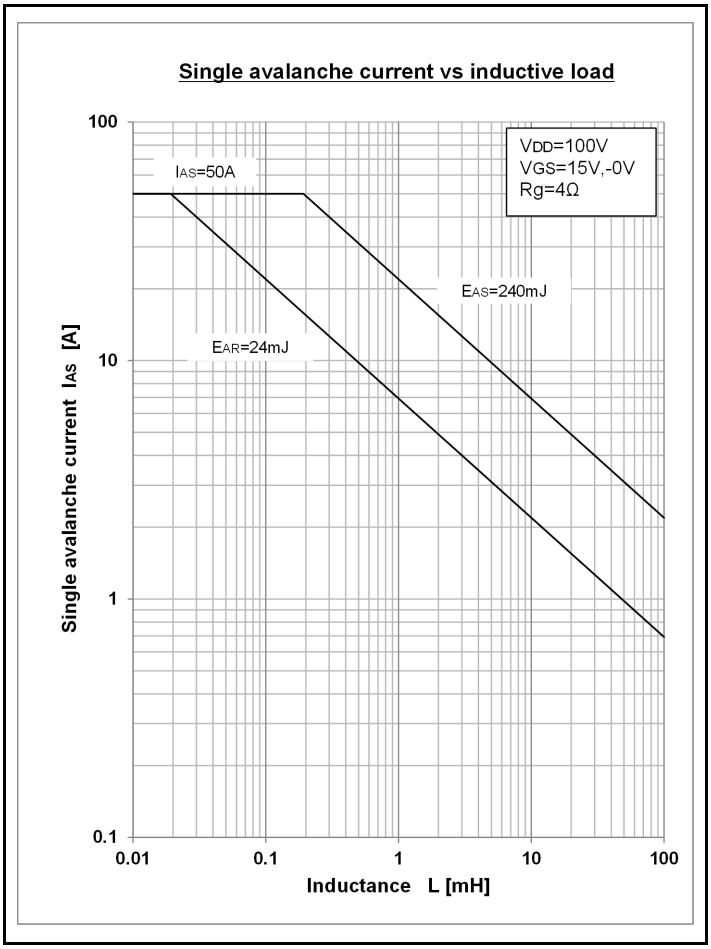

Transient thermal impedance
Time t [s]
1.E+01
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1
0.1
0.01
0.001


Capacitance characteristics
Capacitance Ciss Coss Crss [pF]
Drain-source voltage VDS [V]
Ciss
Coss
Crss
Tc=25°C
f=1MHz
Typ
100000
10000
1000
100
10
1
0
50
100
150
200
250
280


Power derating vs case temperature
Power derating [%]
Case temperature Tc [°C]
100
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150


Gate charge characteristics
Drain-source voltage VDS [V]
Gate-source voltage VGS [V]
Total gate charge Qg [nC]
VDS
VGS
VDS=200V
100V
50V
ID=85A
Tc=25°C
Typ
250
200
150
100
50
0
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
180


Single avalanche energy derating
vs starting channel temperature
Single avalanche energy derating [%]
100
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150
Starting channel temperature Tch [°C]

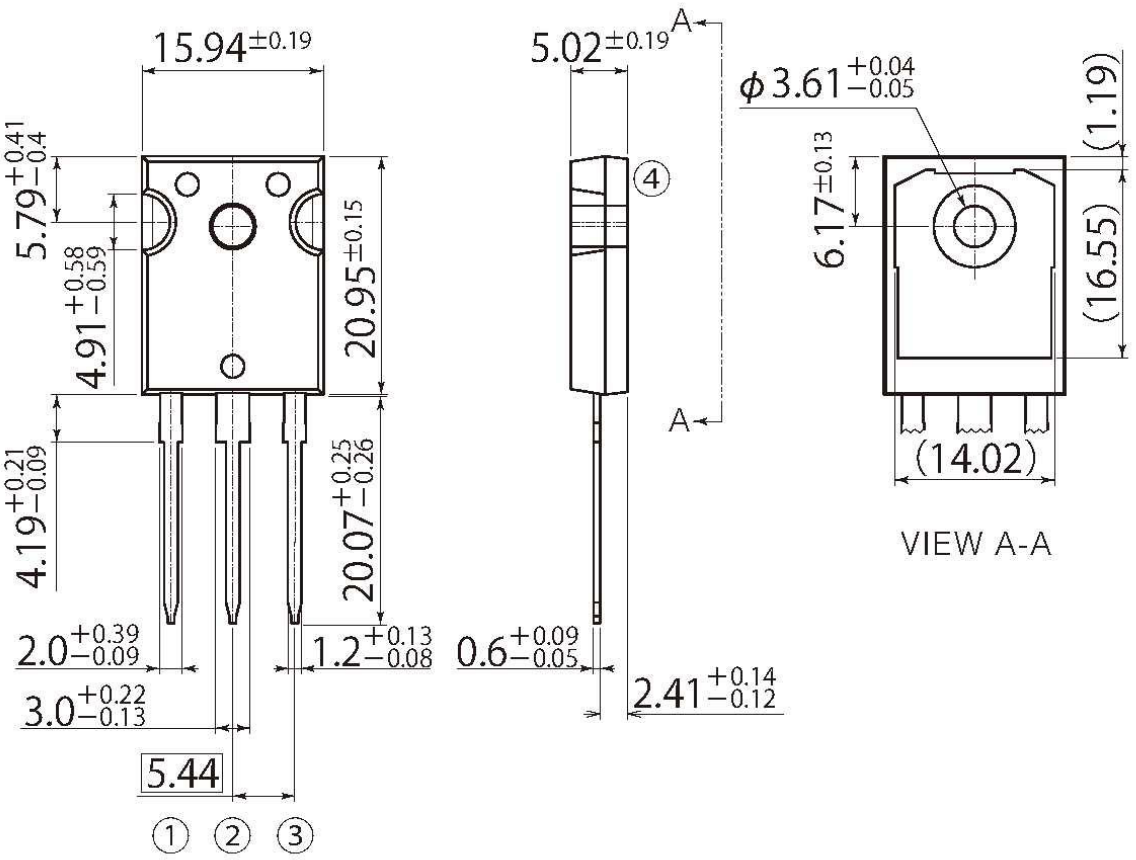

Single avalanche current vs inductive load
VDD=100V
VGS=15V,-0V
Rg=4Ω
IAS=50A
EAS=240mJ
EAR=24mJ
Single avalanche current IAS [A]
100
10
1
0.1
0.01
0.1
1
10
100
Inductance L [mH]

Outline Dimensions

unit:mm

K8

JEDEC Code	TO-247AD
JEITA Code	–
House Name	GC



Notes

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