

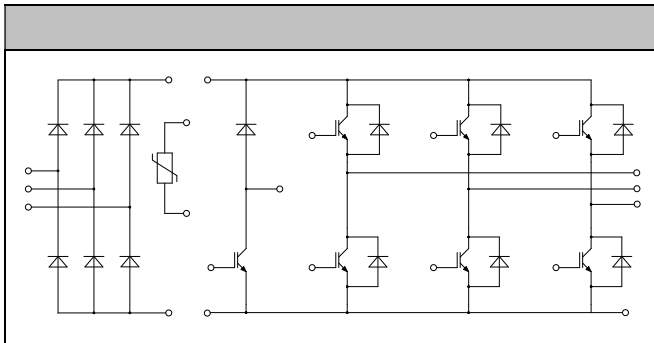


MG50P12E2



1200V
50A

Motor Drivers
AC and DC servo drive amplifier
UPS (Uninterruptible Power Supplies)



Low switching losses
Low $V_{ce(sat)}$ with positive temperature coefficient
Including fast & soft recovery anti-parallel FWD
Low inductance case
High short circuit capability(10us)
Maximum junction temperature 175°C

Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mA, T_{vj}=25$	1200	V
Continuous Collector Current	I_C	$T_c=100$ v_{jmax} 175	50	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	100	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25$	20	V
Total Power Dissipation	P_{tot}	$T_c=25$ $T_{vjmax}=175$	288	W



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Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.7mA, T_{vj}=25$	5.2	5.8	6.4	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=50A, V_{GE}=15V, T_{vj}=25$		1.90	2.30	V	
		$I_C=50A, V_{GE}=15V, T_{vj}=125$		2.20			
		$I_C=50A, V_{GE}=15V, T_{vj}=150$		2.30			
Gate Charge	Q_G			0.35		uC	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		2.60		nF	
Reverse Transfer Capacitance	C_{res}			0.10		nF	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=50A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=15\Omega$ $T_{vj}=25$		168		ns	
Rise Time	t_r			34		ns	
Turn-off Delay Time	$t_{d(off)}$			320		ns	
Fall Time	t_f			78		ns	
Energy Dissipation During Turn-on Time	E_{on}			5.42		mJ	
Energy Dissipation During Turn-off Time	E_{off}			4.15		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=50A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=15\Omega$ $T_{vj}=125$		175		ns
Rise Time	t_r				42		ns
Turn-off Delay Time	$t_{d(off)}$				426		ns
Fall Time	t_f				148		ns
Energy Dissipation During Turn-on Time	E_{on}			7.26		mJ	
Energy Dissipation During Turn-off Time	E_{off}			5.80		mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150$, $V_{cc}=900V, V_{CEM} \leq 1200V$			220		A



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Repetitive Peak Reverse Voltage	V_{RRM}	$T_{vj}=25$	1200	V
Continuous DC Forward Current	I_F		50	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1ms$	100	A
Reverse Recovery Energy E_{rr}	I_{RR}	$V_R=0, t_p=10ms, T_{vj}=125$	560	A ² s
		$V_R=0, t_p=10ms, T_{vj}=150$	480	

Forward Voltage	V_F	$I_F=50A, T_{vj}=25$	2.10	2.50	V
		$I_F=50A, T_{vj}=125$	2.15		
		$I_F=50A, T_{vj}=150$	2.15		
Recovered Charge	Q_{rr}	$I_F = 50 A$	5.8		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$ $-di_F/dt = 1500A/us$	56		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25$	1.85		mJ



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Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mA, T_{vj}=25$	1200	V
Continuous Collector Current	I_C	$T_c=100$ v_{jmax} 175	35	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	70	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25$	20	V
Total Power Dissipation	P_{tot}	$T_c=25$ $T_{vjmax}=175$	227	W

Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.4mA, T_{vj}=25$	5.2	5.8	6.4	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^\circ C$			1.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=35A, V_{GE}=15V, T_{vj}=25$		1.85	2.25	V	
		$I_C=35A, V_{GE}=15V, T_{vj}=125$		2.15			
		$I_C=35A, V_{GE}=15V, T_{vj}=150$		2.25			
Gate Charge	Q_G			0.27		uC	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^\circ C$		2.00		nF	
Reverse Transfer Capacitance	C_{res}			0.07		nF	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=35A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=12\Omega$ $T_{vj}=25$		25		ns	
Rise Time	t_r			13		ns	
Turn-off Delay Time	$t_{d(off)}$			24		ns	
Fall Time	t_f			115		ns	
Energy Dissipation During Turn-on Time	E_{on}				1.90		mJ
Energy Dissipation During Turn-off Time	E_{off}				2.00		mJ





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Repetitive Peak Reverse Voltage	V_{RRM}	$T_j=25$	1600	V
Average output Current 50/60Hz, sine wave	$I_{F(AV)}$	$T_c=100$	65	A
Maximum RMS Current at Rectifier Output	I_{RMSM}	$T_c=100$	110	A
Surge Forward Current	I_{FSM}	$V_R=0, t_p=10ms, T_j=45$	850	A
I^2t -value	I^2t	$V_R=0, t_p=10ms, T_j=45$	3610	A^2s

Diode Forward Voltage	V_F	$I_F=50A, T_j=125$	1.0	V
Reverse Current	I_R	$T_j=125, V_R=1600V$	1.5	mA

Rated Resistance	R_{25}		5.0	k	
Deviation of R100	R/R	$T_c=100, R_{100}=493.3$	-5	5	%
Power Dissipation	P_{25}			20.0	mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15 K))]$	3375		K

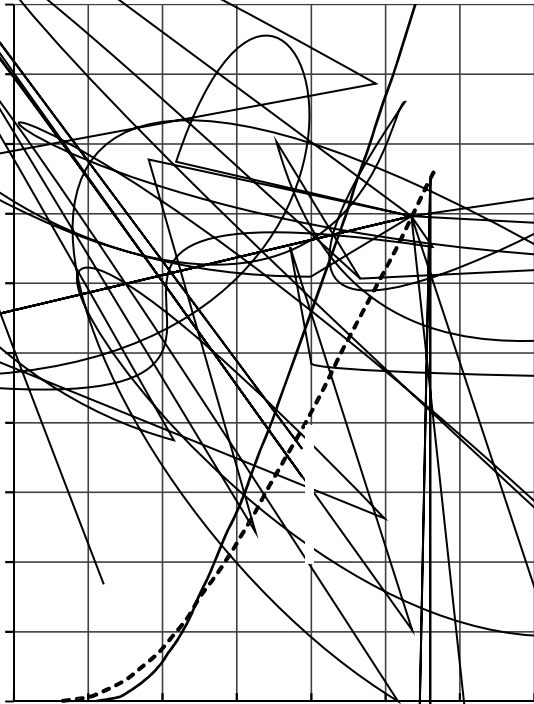


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Isolation voltage	V_{isol}	$t=1min, f=50Hz$	2500			V
Maximum Junction Temperature	T_{jmax}				175	
Operating Junction Temperature	$T_{vj op}$		-40		150	
Storage Temperature	T_{stg}		-40		125	
Stray-inductance-module	L_{SCE}			60		
Module lead resistance, terminals-chip	$R_{cc'+EE'}$	$T_C=25$, per switch		4.0		
	$R_{AA'+CC'}$			3.0		
Thermal Resistance Junction-to Case	R_{JC}	per IGBT-inverter			0.52	K/W
		per Diode-inverter			0.81	
		per IGBT-brake-copper			0.66	
		per Diode-chopper			1.50	
		per Diode-rectifier			0.64	
Thermal Resistance Case-to Sink	R_{CS}	per IGBT-inverter		0.29		K/W
		per Diode-inverter		0.44		
		per IGBT-brake-copper		0.32		
		per Diode-chopper		0.33		
		per Diode-rectifier		0.70		
		per Module		0.009		
Mounting Force Per Clamp	F		3.0		6.0	N
Weight of Module	G			300		g

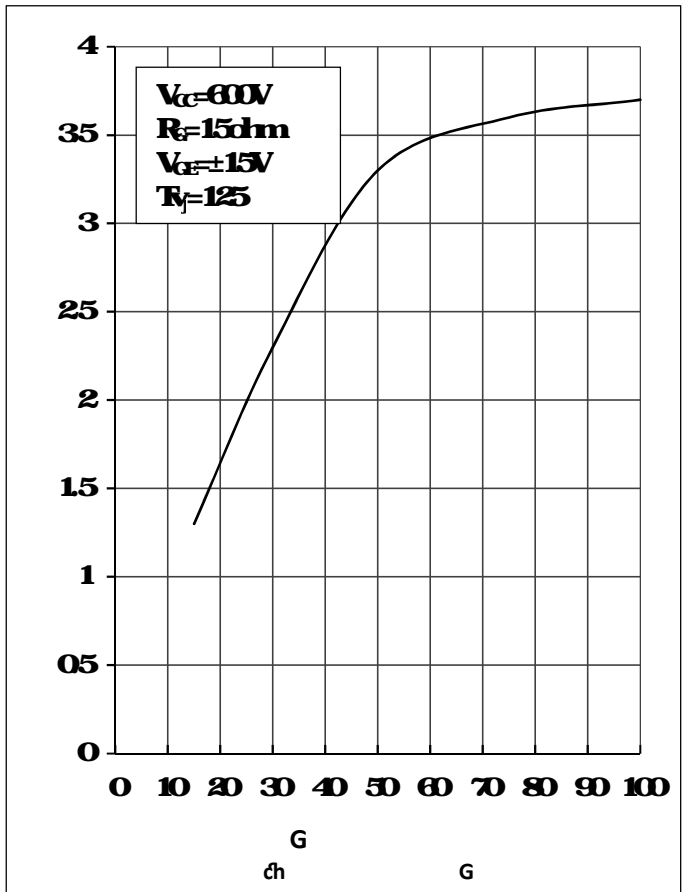
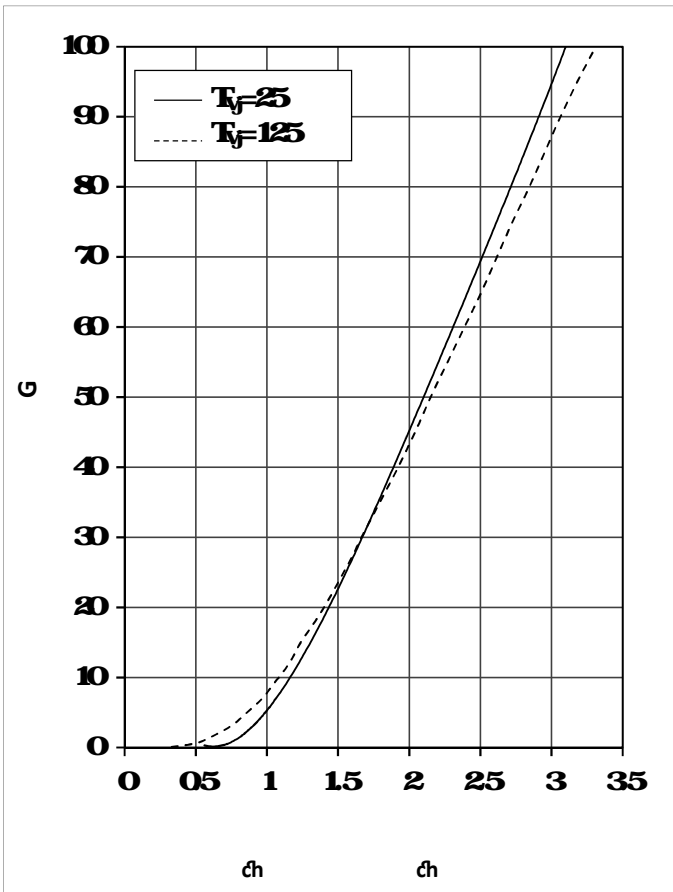
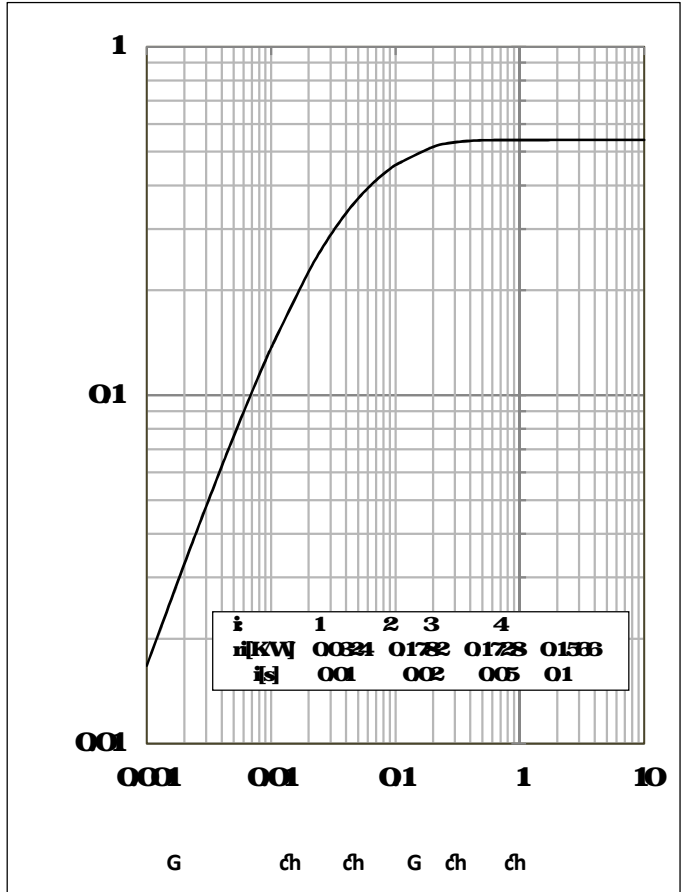
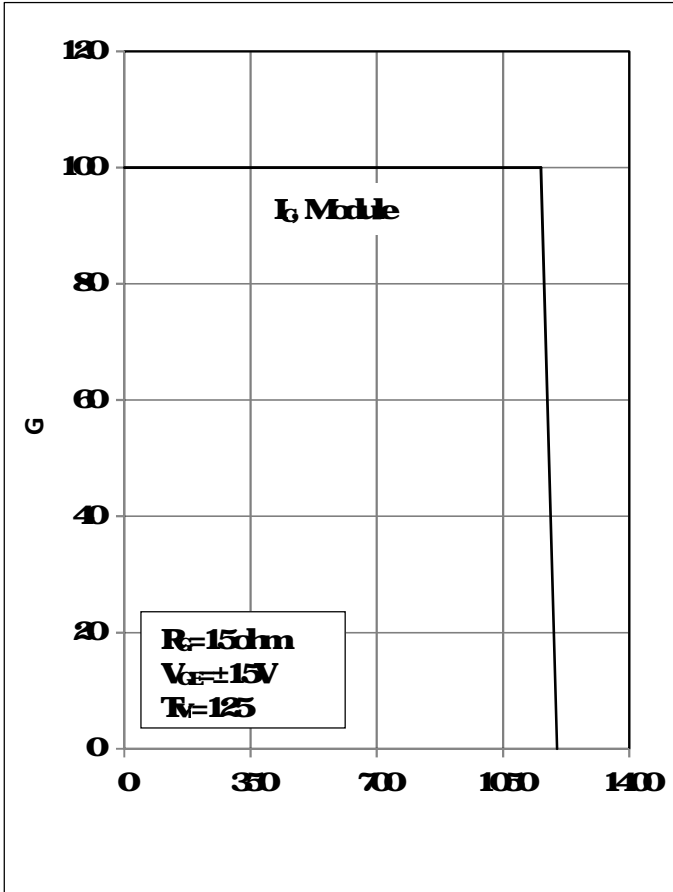


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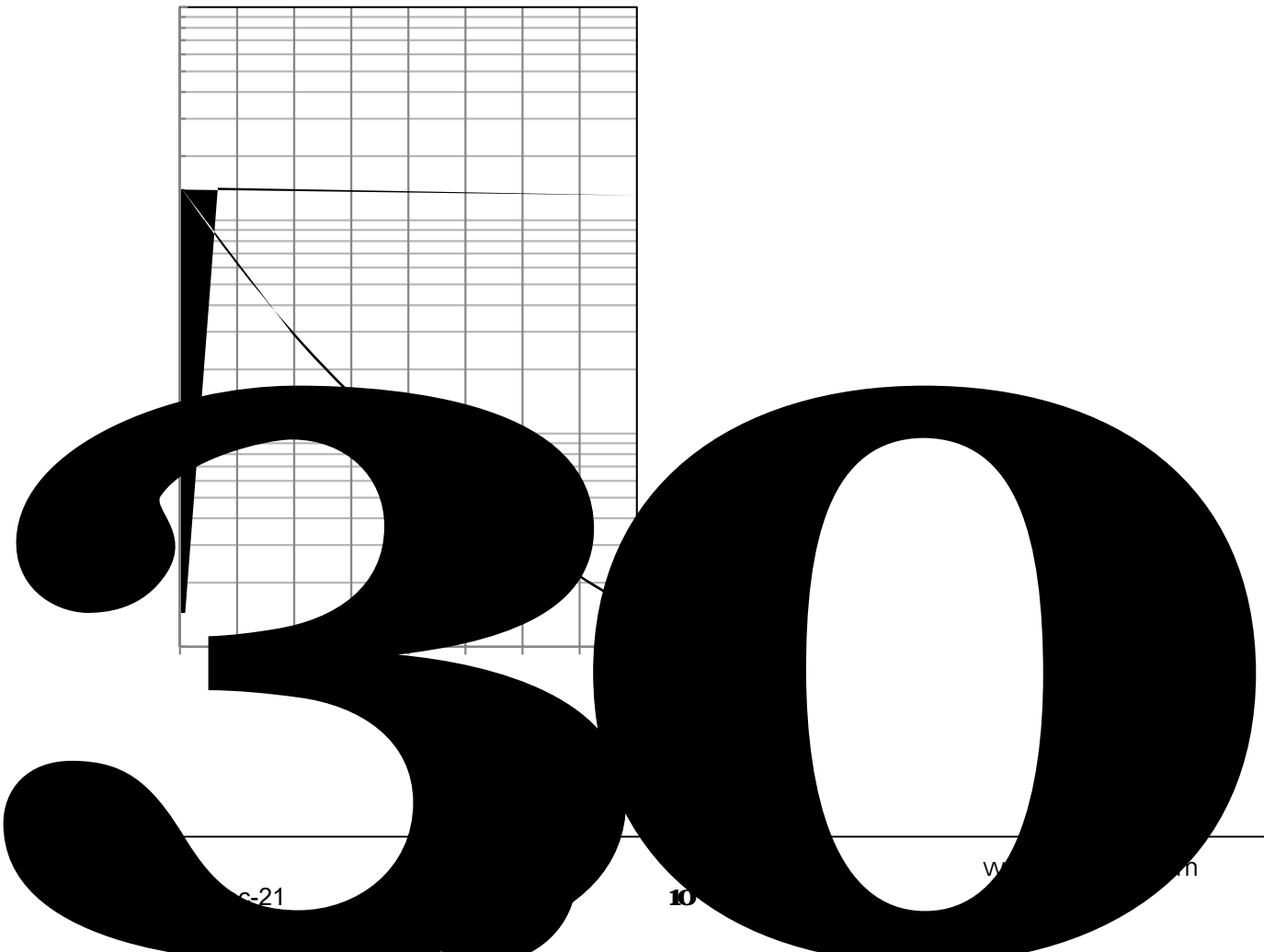
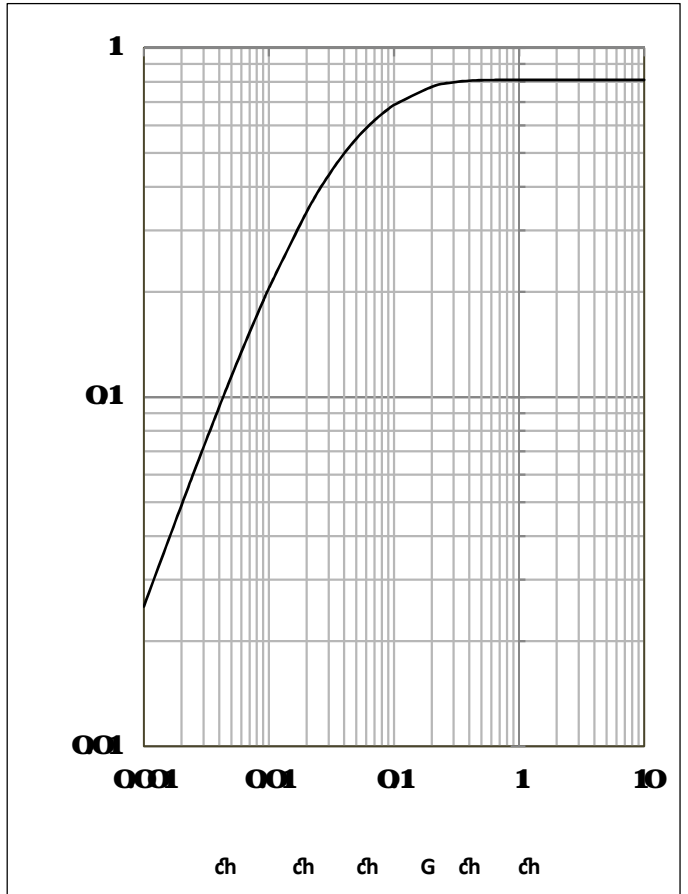
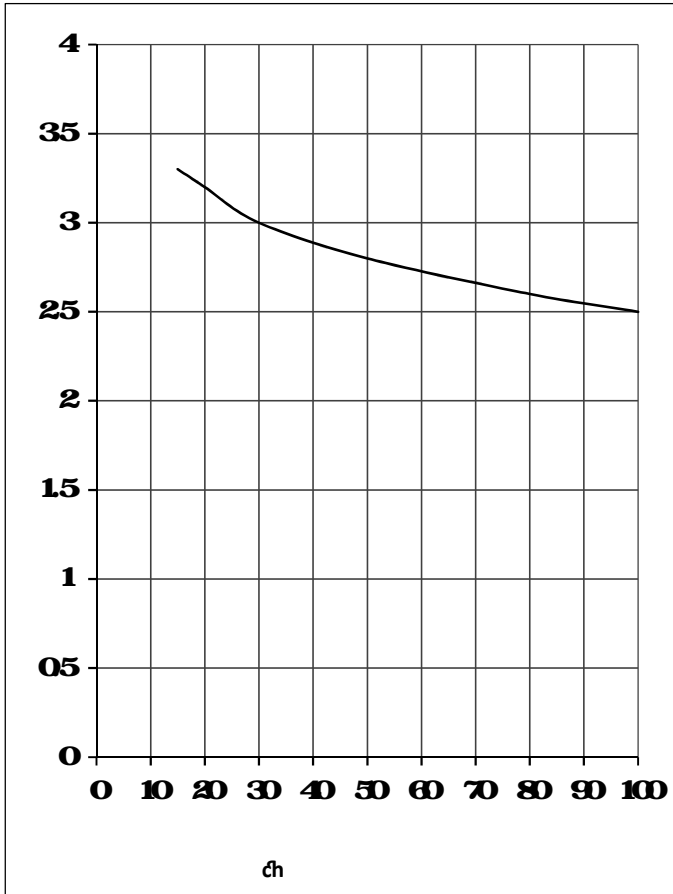


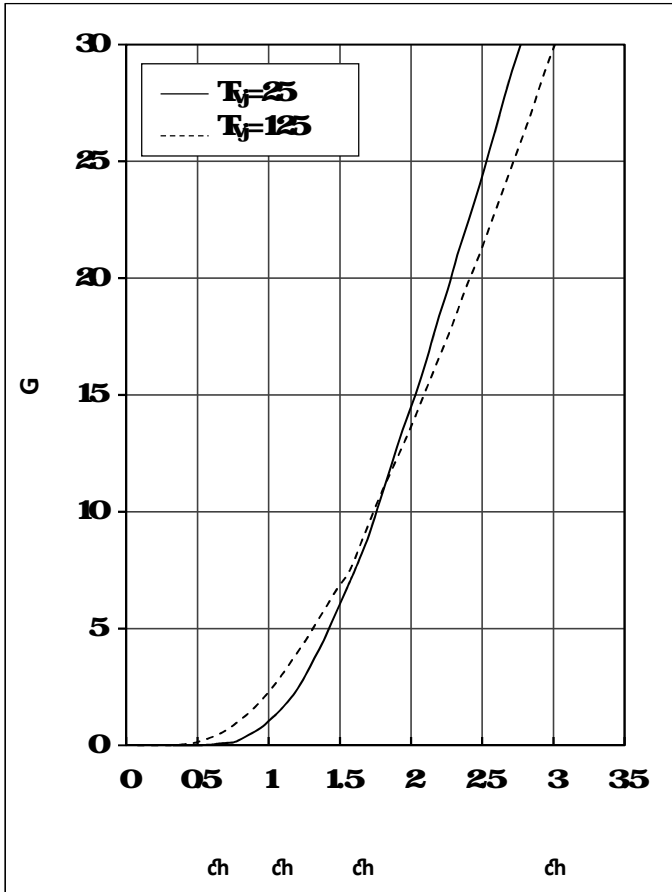
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