



CTC85XRG12

30 V P-channel MOSFET with pre-biased NPN transistor

z General description

P-channel enhancement mode Field-Effect Transistor (FET) in Trench MOSFET technology and NPN Resistor-Equipped Transistor (RET) together in a leadless medium power DFN2020-6 Surface-Mounted Device (SMD) plastic package.

z Features and benefits

Trench MOSFET technology
 NPN transistor built-in bias resistors
 Small and leadless ultra thin SMD plastic package: 2 x 2 x 0.60 mm
 Exposed drain pad for excellent thermal conduction

z Applications

Charging switch for portable devices
 High-side load switch
 USB port overvoltage protection
 Power management in battery-driven portables
 Hard disk and computing power management

z Pin configuration

Top view

Bottom view

z Quick reference data

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z Absolute Maximum Ratings @ TA = 25°C unless otherwise specified

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	-30V	V
Gate-Source Voltage		V_{GS}	±12	
Drain Current ^(Note 1)	Continuous	I_D	-4	A
	Pulsed	I_{DM}	-17	
Collector-Base Voltage		V_{CBO}	50	V
Collector-Emitter Voltage		V_{CEO}	40	V
Emitter-Base Voltage		V_{EBO}	6	V
Collector Current ^(Note 1)	Continuous	I_C	0.2	A
Power Dissipation Derating above TA = 25°C ^(Note 1)		P_d	1.35	W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Note1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inches. The rating is for each chip in the package.

z Electrical Characteristics @ TA = 25°C unless otherwise specified

Parameter ^(Note 2)	Symbol	Test Conditions	Min	Typ	Max	Unit
N-Channel mosfet						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	--	--	-1	uA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.7	--	-1.3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$I_D = -4.2A, V_{GS} = -10V$	--	51	65	mR
		$I_D = -4A, V_{GS} = -4.5V$	--	60	75	
		$I_D = -1A, V_{GS} = -2.5V$	--	98	190	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6V, R_L = 6R, I_D = -1A,$ $V_{GEN} = -4.5V, R_G = 6R$	--	6.5	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	40	--	
Input Capacitance	C_{ISS}	$V_{DS} = -30V, V_{GS} = 0V,$ $F = 200KHz$	--	600	--	pF
Output Capacitance	C_{OSS}		--	85	--	
Reverse Transfer Capacitance	C_{RSS}		--	66	--	
Diode Forward Voltage ⁽¹⁾	V_{SD}	$V_{GS} = 0V, I_S = -1A$	--	-0.78	-1.2	V
NPN BJT						
Collector-Base Breakdown Voltage	$BVCBO$	$I_C = 1mA, I_E = 0mA$	50			V
Collector-Emitter Breakdown Voltage	$BVCEO$	$I_C = 1mA, I_B = 0mA$	40			V
Emitter-Base Breakdown Voltage	$BVEBO$	$I_E = 100\mu A, I_C = 0mA$	6			V
Collector cut off current	$ICBO$	$V_{CB} = 40V, I_E = 0mA$			-1	uA
Emitter cut off current	$IEBO$	$V_{EB} = 6V, I_C = 0mA$			100	nA
DC Current Gain	HFE	$V_{CE} = 1V, I_C = 100mA$	100		300	
Collector-Emitter Saturation Voltage	$VCESAT$	$I_C = 800, I_B = 80mA$			0.55	V



● Typical Performance Characteristics

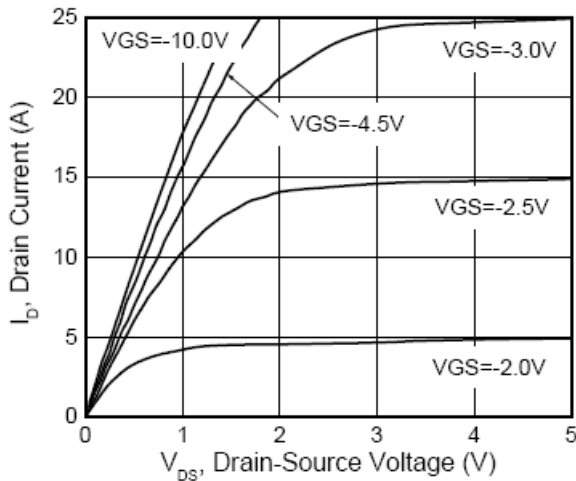


Figure 1. Output Characteristics

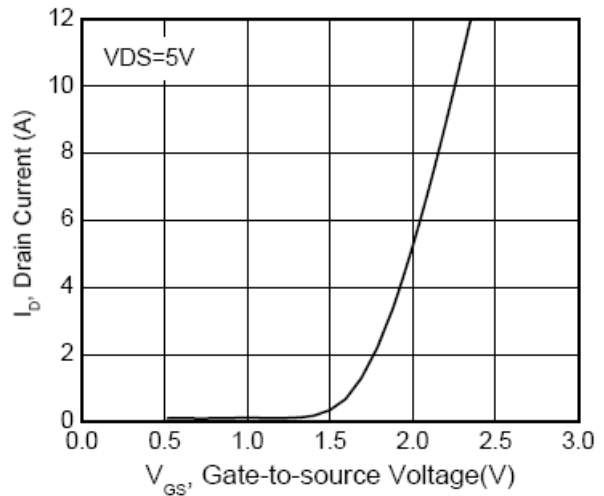


Figure 2. Transfer Characteristics

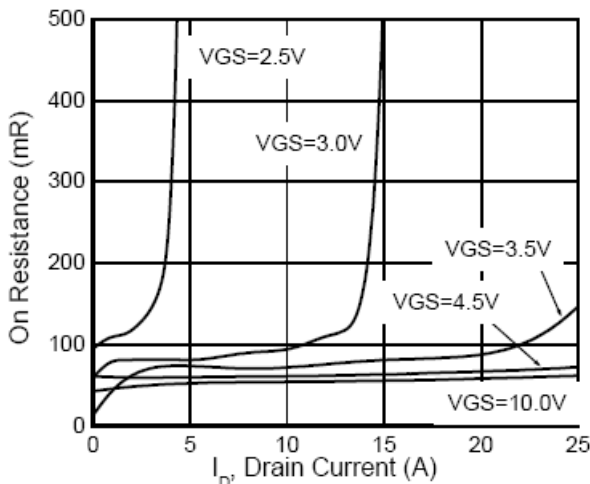


Figure 3. On Resistance vs. Drain Current

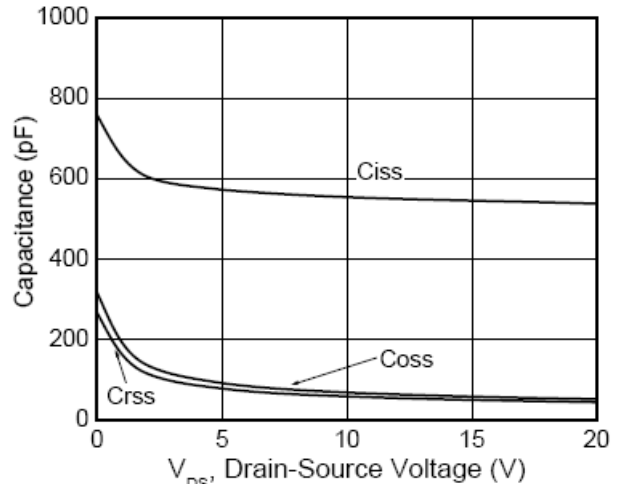


Figure 4. Capacitance

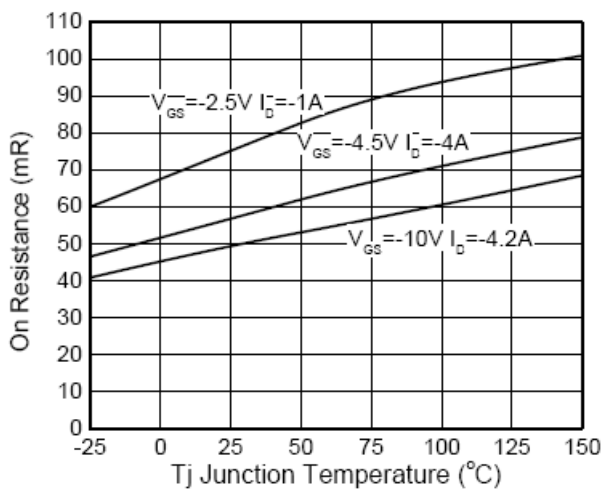


Figure 5. On resistance vs. Temperature

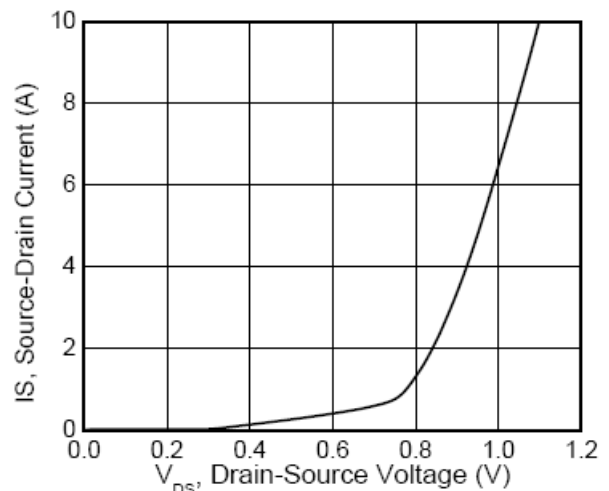


Figure 6. Diode Forward Characteristics



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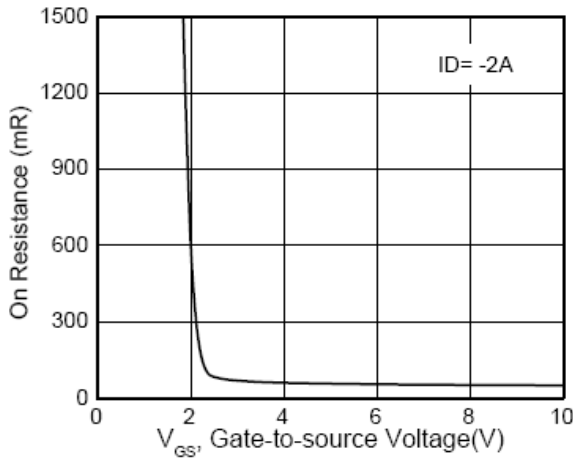


Figure 7. On Resistance vs. G-S Voltage

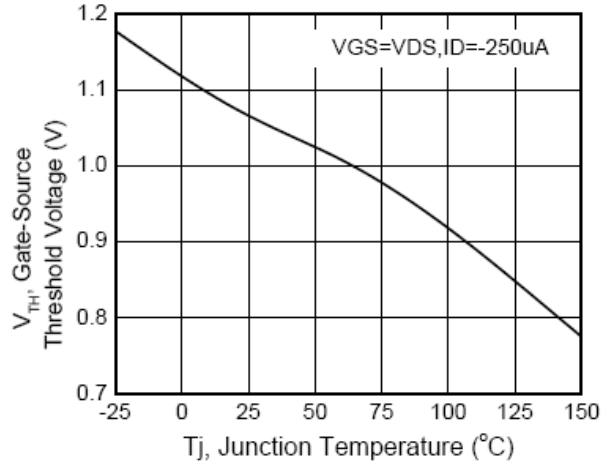
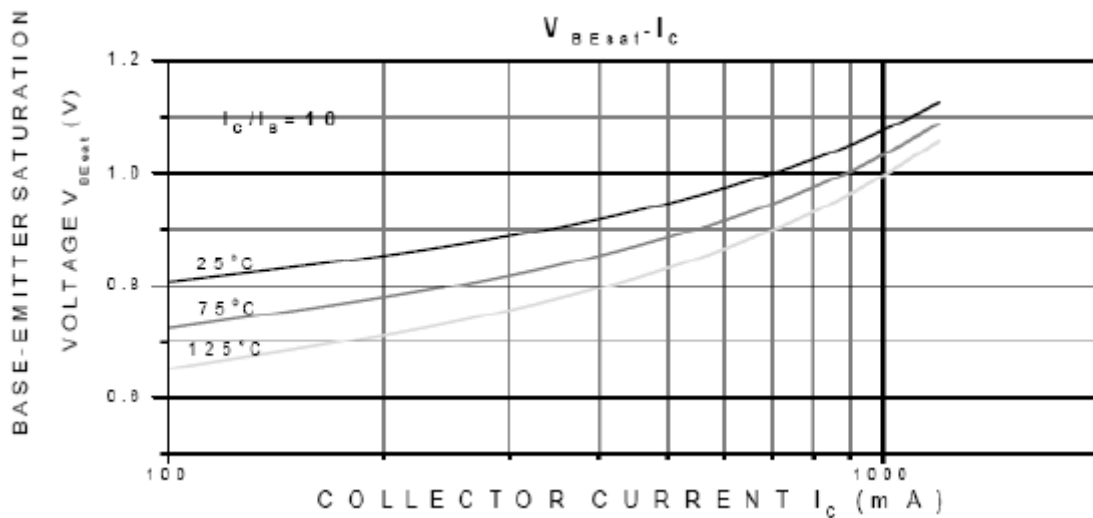
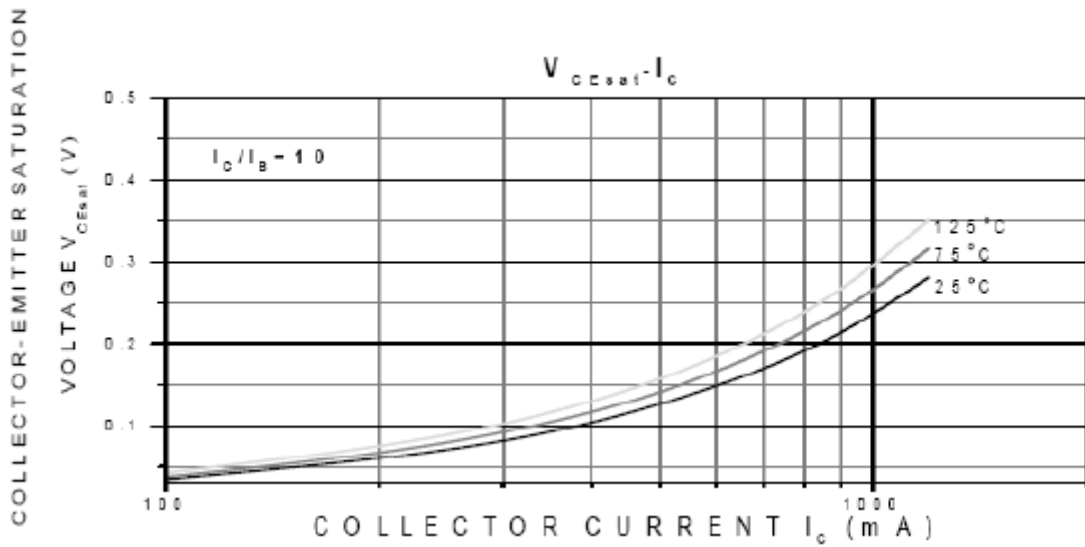


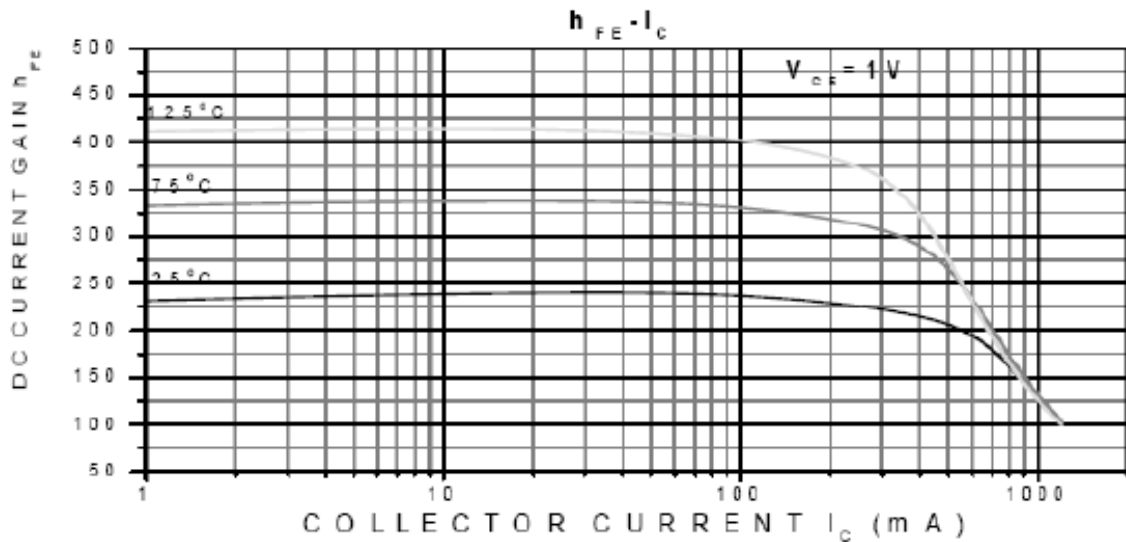
Figure 8. Gate Threshold vs. Temperature





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- Package Information

