

General Description

The MYP020CC uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

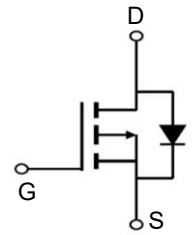
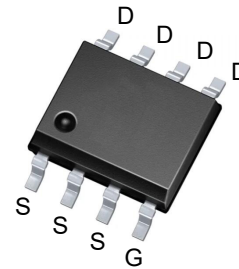


Features

V_{DSS}	-30	V
I_D	-12	A
$R_{DS(ON)}$ (at $V_{GS} = -10V$)	15	m Ω
$R_{DS(ON)}$ (at $V_{GS} = -4.5V$)	16	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MYP020CC	SOP-8	020DP	3000

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ\text{C}$	Drain Current ³ , $V_{GS} @ 10V$	-12	A
$I_D @ T_A = 70^\circ\text{C}$	Drain Current ³ , $V_{GS} @ 10V$	-10	A
I_{DM}	Pulsed Drain Current ¹	-50	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	2.5	W
	Linear Derating Factor	0.02	W/ $^\circ\text{C}$
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient ³	50	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-7A$	-	15	20	m Ω
		$V_{GS}=-4.5V, I_D=-5A$	-	25	32	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-7A$	-	16	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V$	-	-	-30	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge	$I_D=-7A$ $V_{DS}=-24V$ $V_{GS}=-4.5V$	-	18	29	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge		-	10	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=-15V$ $I_D=-1A$ $R_G=3.3\Omega$ $V_{GS}=-10V$	-	8	-	ns
t_r	Rise Time		-	6.6	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	44	-	ns
t_f	Fall Time		-	34	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=-25V$ $f=1.0MHz$	-	1175	1690	pF
C_{oss}	Output Capacitance		-	195	-	pF
C_{rss}	Reverse Transfer Capacitance		-	190	-	pF
V_{SD}	Forward On Voltage ²	$I_S=-2.1A, V_{GS}=0V$	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	$I_S=-7A, V_{GS}=0V, dI/dt=100A/\mu s$	-	28	-	ns
Q_{rr}	Reverse Recovery Charge		-	18	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in² copper pad of FR4 board, $t \leq 10\text{sec}$; $125\text{ }^{\circ}\text{C/W}$ when mounted on Min. cop

Typical Electrical and Thermal Characteristics

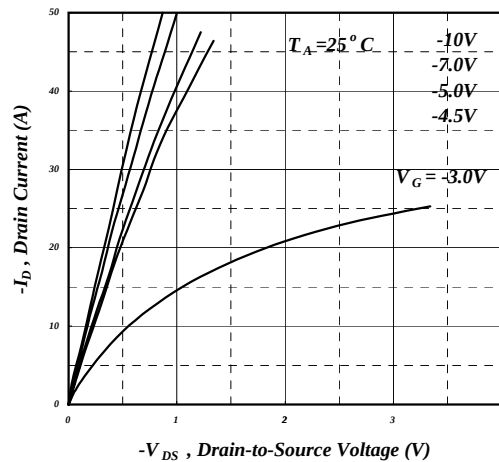


Fig 1. Typical Output Characteristics

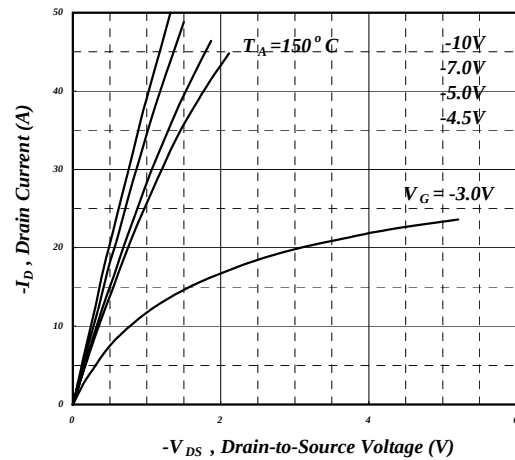


Fig 2. Typical Output Characteristics

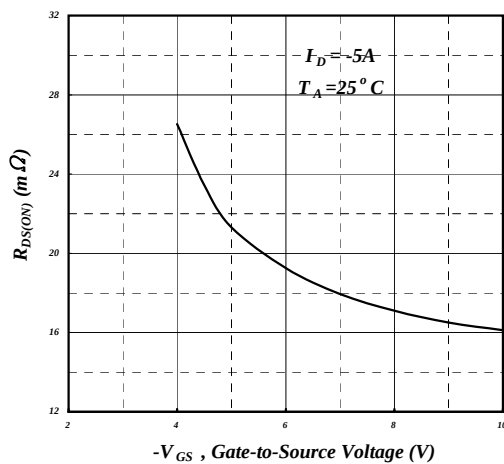
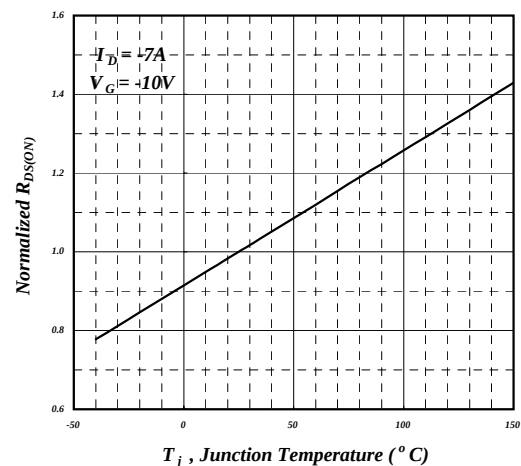
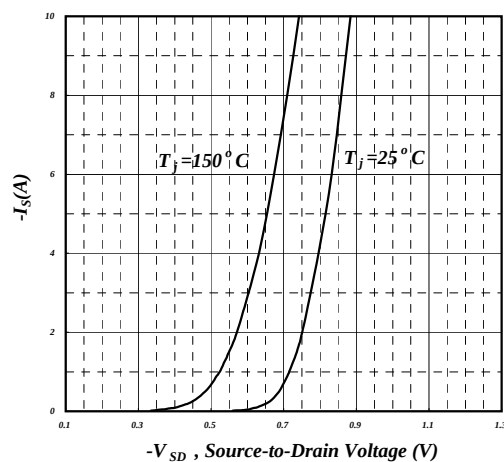


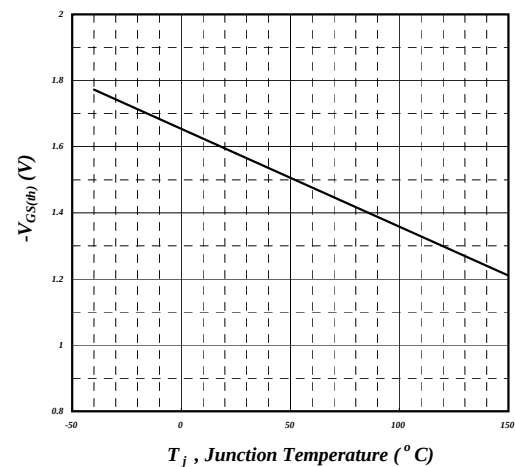
Fig 3. On-Resistance v.s. Gate Voltage



**Fig 4. Normalized On-Resistance
v.s. Junction Temperature**



**Fig 5. Forward Characteristic of
Reverse Diode**



**Fig 6. Gate Threshold Voltage v.s.
Junction Temperature**

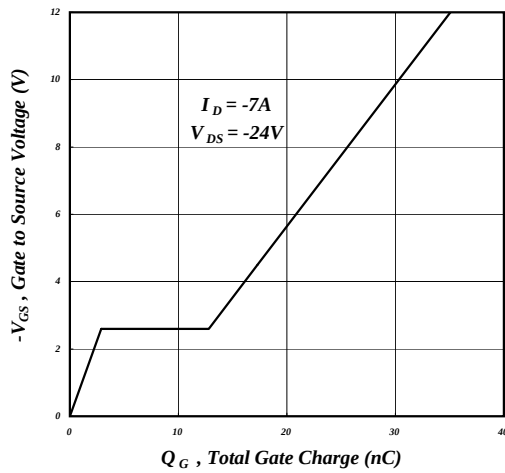


Fig 7. Gate Charge Characteristics

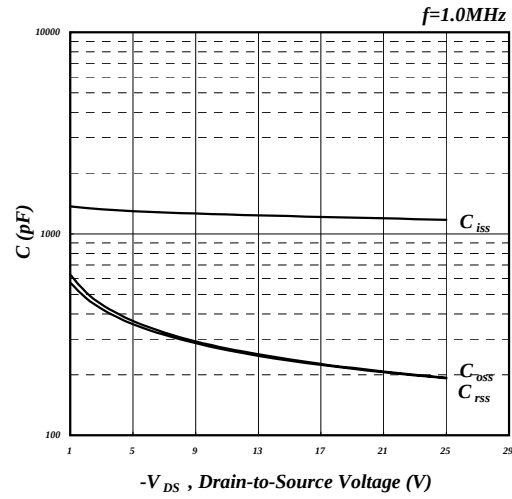


Fig 8. Typical Capacitance Characteristics

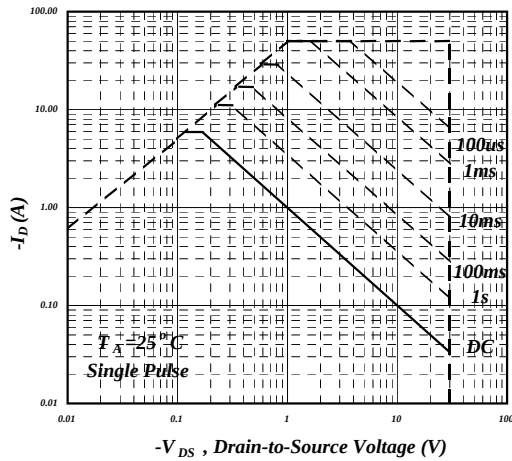


Fig 9. Maximum Safe Operating Area

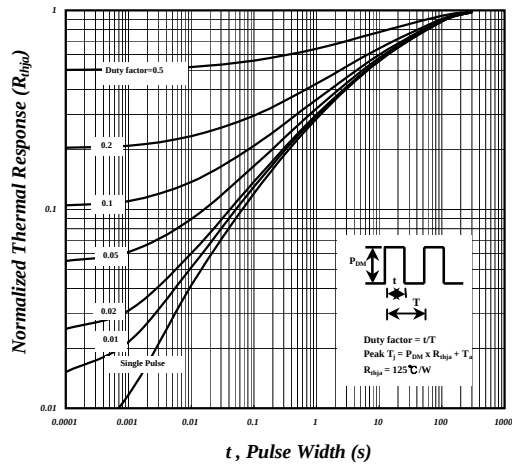


Fig 10. Effective Transient Thermal Impedance

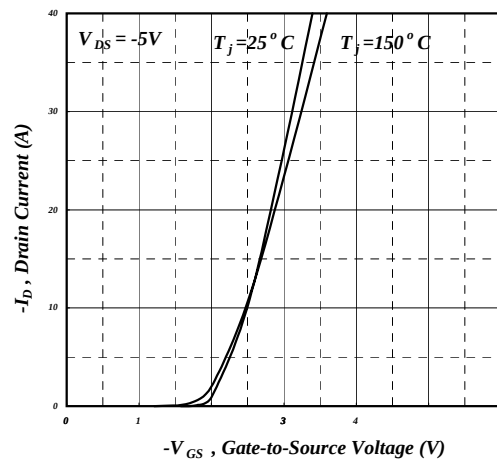


Fig 11. Transfer Characteristics

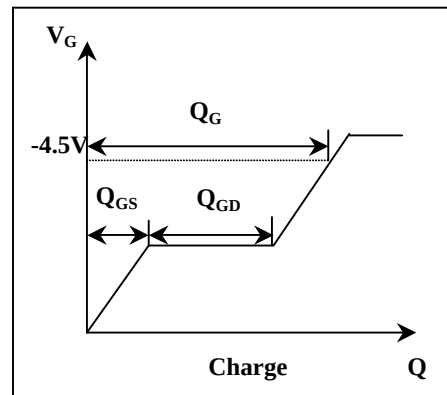
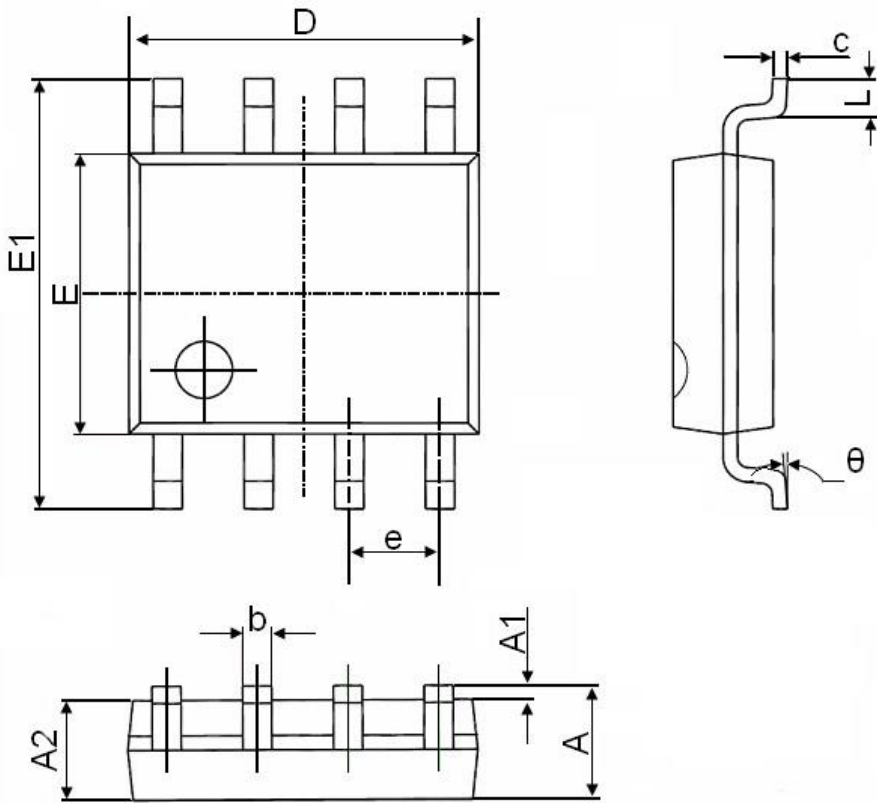


Fig 12. Gate Charge Circuit

Package Mechanical Data-SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050