

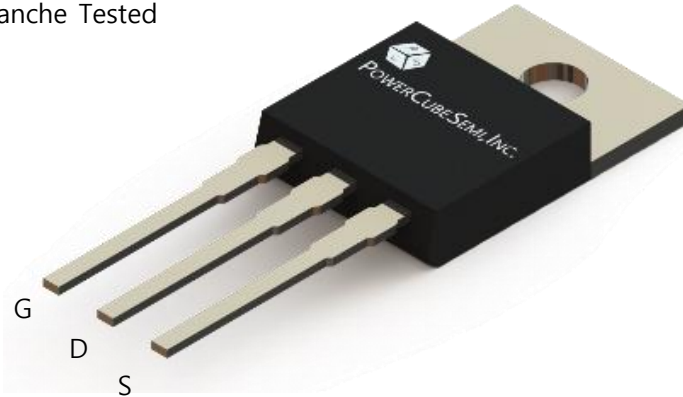
PM003P040AG

-40V -222A 3.7mΩ Si Single P-ch Enhancement Mode MOSFET with Normal Diode

Features

Si P-Ch Enhancement Mode Power MOSFET

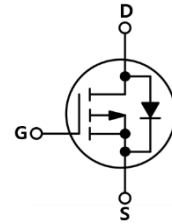
- Rated to -40V at -222Amps @ $T_j = 25^\circ\text{C}$
- Max $R_{DS(on)} = 3.7\text{ m}\Omega$
- Typ $R_{DS(on)} = 2.9\text{ m}\Omega$
- Gate Charge(Typ. $Q_g=206\text{ nC}$)
- 100% Avalanche Tested



PKG type : TO-220

Application

- Power switch
- DC/DC converters



Description

The PM003P040AG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-source breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40	V
I_D	Drain current	$T_c=25^\circ\text{C}$	-222	A
I_{DM}	Drain current	Pulse width limited by junction temperature	-888	A
V_{GS}	Gate-source voltage		± 20	V
E_{AS}	Single pulsed avalanche energy	$V_{GS}=-10V, R_G=25\Omega$ $V_{DD}=-40V, L=0.5mH$	625	mJ
P_d	Power dissipation	$T_c=25^\circ\text{C}$	312	W
T_j	Operating junction		150	$^\circ\text{C}$
T_{stg}	Storage temperature		-55 to 150	$^\circ\text{C}$



Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PM003P040AG	PM003P040	TO-220	TUBE	-	50

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
BV_{DSS}	Drain-source breakdown voltage	$V_{GS} = 0V, I_D = -250\mu A, T_J = 25^\circ C$	-40	-	-	V
I_{DSS}	Zero gate voltage drain current	$V_{DS} = -40V, V_{GS} = 0V$	-	-	-1	μA
I_{GSS}	Gate-source leakage current	$V_{GS} = \pm 20V$	-	-	± 100	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.6	-2.5	V
$R_{DS(on)}$	Static drain-source on state resistance	$V_{GS} = -10V, I_D = -20A$	-	2.9	3.7	m Ω
		$V_{GS} = -4.5V, I_D = -20A$	-	3.7	5.0	
g_{FS}	Forward transconductance	$V_{DS} = -5V, I_D = -20A$	-	43	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DD} = -20V, I_D = -20A, R_G = 1.6\Omega$	-	44	-	ns
t_r	Turn-on Rise time		-	49	-	
$t_{d(off)}$	Turn-off Delay time		-	138	-	
t_f	Turn-off Fall time		-	44	-	



Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		0.4	-	°C/W
C_{iss}	Input capacitance	$V_{DS} = -20V, V_{GS} = 0V,$ $f = 1.0MHz$	15087	-	pF
C_{oss}	Output capacitance		2079	-	
C_{rss}	Reverse transfer capacitance		1401	-	
$Q_{g(tot)}$	Total gate charge at 10V	$V_{DD} = -20V, I_D = -20A$ $V_{GS} = -10V$	206	-	nC
Q_{gs}	Gate to source gate charge		41	-	
Q_{gd}	Gate to drain "Miller" charge		26	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum continuous drain to source diode forward current	$T_c = 25^\circ C$	-	-222	A
V_{SD}	Drain to source diode forward voltage	$I_{SD} = -20A, V_{GS} = 0V$	-	-1.2	V
T_{rr}	Reverse recovery time	$I_F = -20A, V_{GS} = 0V,$ $di_F/dt = -100A/\mu s$	77	-	ns
Q_{rr}	Reverse recovery charge		198	-	nC

Typical Characteristics

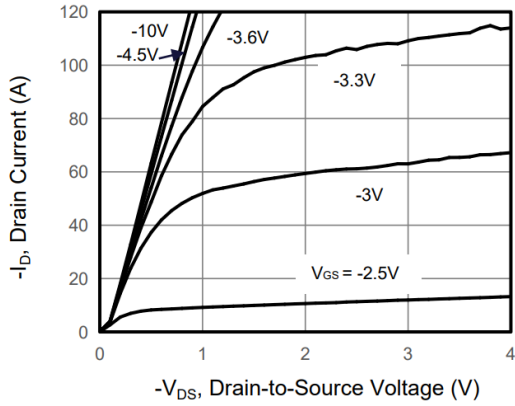


Figure 1. Output Characteristics

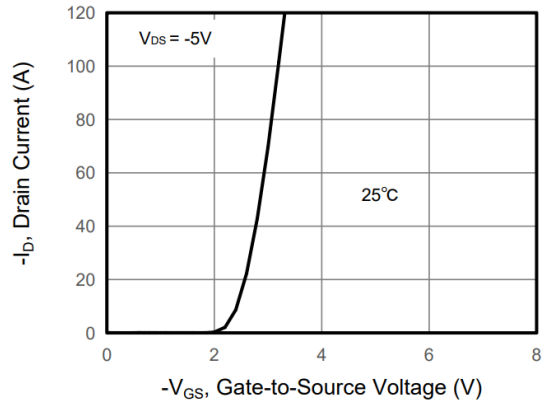


Figure 2. Transfer Characteristics

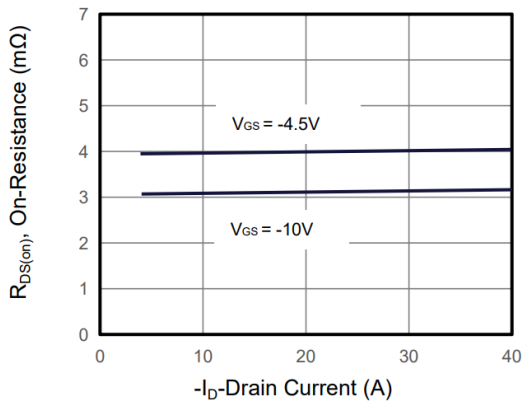


Figure 3. Drain Source On Resistance

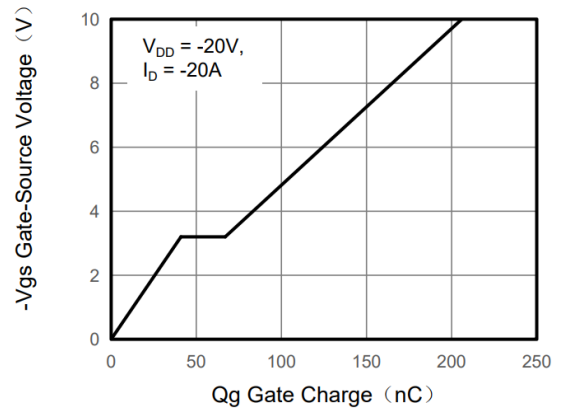


Figure 4. Gate Charge

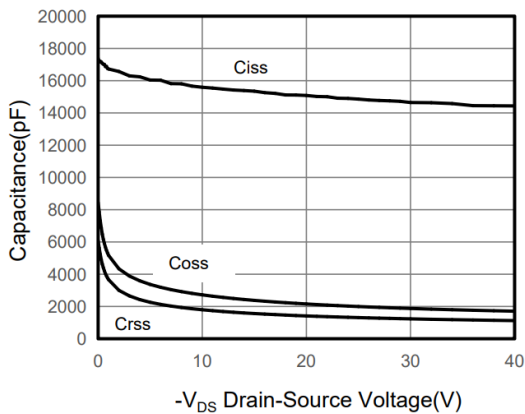


Figure 5. Capacitance

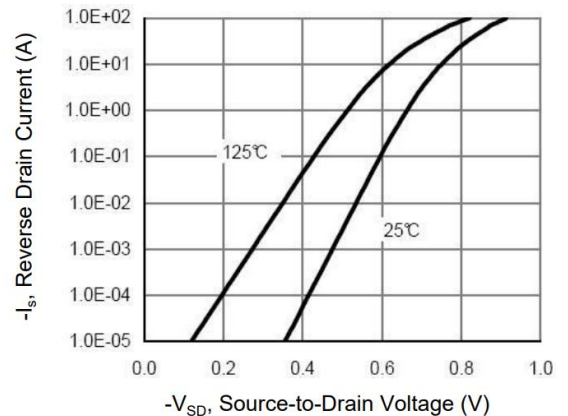


Figure 6. Source-Drain Diode Forward

Typical Characteristics

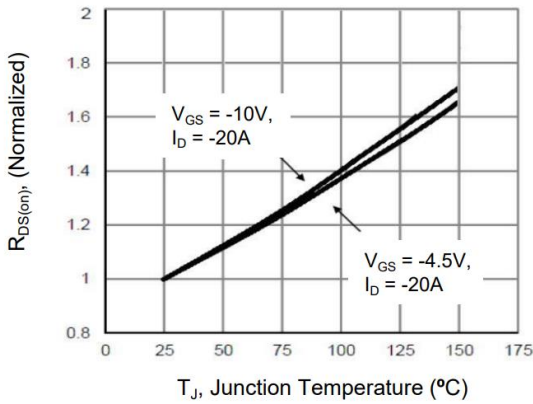


Figure 7. Drain-Source On-Resistance

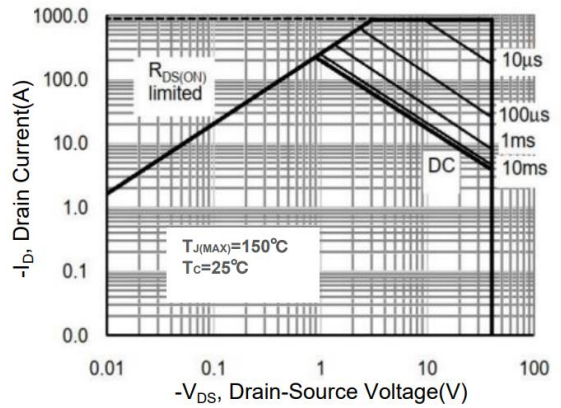


Figure 8. Safe Operation Area

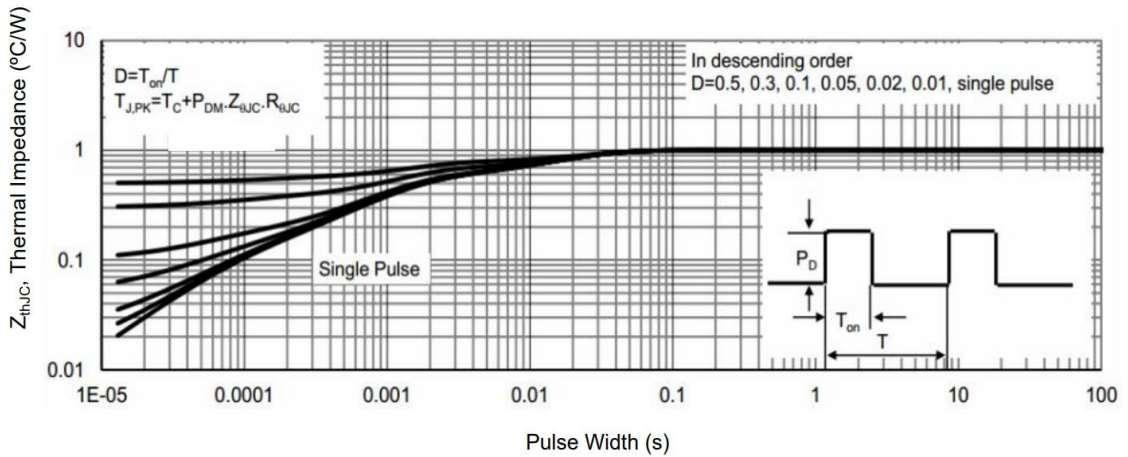


Figure 9. Normalized Maximum Transient Thermal Impedance



Package Outline

Unit : mm

