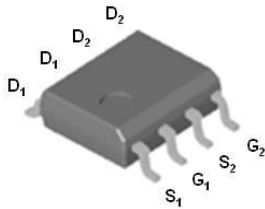


# P5003QVG

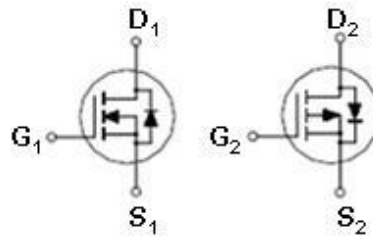
## N&P-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$	Channel
30V	27.5m $\Omega$ @ $V_{GS} = 10V$	10A	N
-30V	45m $\Omega$ @ $V_{GS} = -10V$	-7A	P



SOP-8



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	CH.	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	N	30	V
			P	-30	
Gate-Source Voltage		$V_{GS}$	N	$\pm 20$	
			P	$\pm 20$	
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	$I_D$	N	10	A
			P	-7	
	$T_A = 70\text{ }^\circ\text{C}$		N	7	
			P	-5	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	N	20	
			P	-20	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	$P_D$	N	2.5	W
			P	2.5	
	$T_A = 70\text{ }^\circ\text{C}$		N	1.6	
			P	1.6	
Junction & Storage Temperature Range		$T_J, T_{STG}$		-55 to 150	$^\circ\text{C}$

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		50	$^\circ\text{C} / \text{W}$
Junction-to-Case	$R_{\theta JC}$		30	$^\circ\text{C} / \text{W}$

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$ .

# P5003QVG

## N&P-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS	
			MIN	TYP	MAX		
<b>STATIC</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	N	30		V	
		V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	P	-30			
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	N	1	1.5	2.5	
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	P	-1	-1.5	-2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	N			±100	
		V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	P			±100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V	N			1	
		V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V	P			-1	
		V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C	N				10
		V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C	P				-10
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 5V, V <sub>GS</sub> = 10V	N	20		A	
		V <sub>DS</sub> = -5V, V <sub>GS</sub> = -10V	P	-20			
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A	N		30	40	
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A	P		62	80	
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A	N		20.5	27.5	
		V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A	P		37.5	45	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 7A	N		16	S	
		V <sub>DS</sub> = -5V, I <sub>D</sub> = -5A	P		13		

<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	N		680	pF
			P		780	
Output Capacitance	C <sub>oss</sub>		N		105	
			P		145	
Reverse Transfer Capacitance	C <sub>rss</sub>		N		75	
			P		79	
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 0.5*V <sub>(BR)DSS</sub> , V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A	N		14	nC
			P		15.1	
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>		N		1.9	
			P		2.1	
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>		N		3.3	
			P		4.0	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =15mV, V <sub>DS</sub> =0V, f=1MHz	N		1.7	2.5
			P		3.5	6

## P5003QVG

### N&P-Channel Enhancement Mode MOSFET

DYNAMIC							
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel $V_{DD} = 10V$ $I_D \cong 1A, V_{GS} = 10V, R_{GEN} = 3\Omega$	N		4.6	7	nS
			P		7.7	11.5	
Rise Time <sup>2</sup>	$t_r$		N		4	6	
			P		5.7	8.5	
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$	P-Channel $V_{DD} = -10V$ $I_D \cong -1A, V_{GS} = -10V, R_{GEN} = 3\Omega$	N		20	30	
			P		20	30	
Fall Time <sup>2</sup>	$t_f$		N		5	8	
			P		9.5	14	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ( $T_J = 25^\circ C$ )							
Continuous Current	$I_S$		N			1.3	A
			P			-1.3	
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 1A, V_{GS} = 0V$	N			1	V
			P			-1	

<sup>1</sup>Pulse test : Pulse Width  $\leq 300 \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

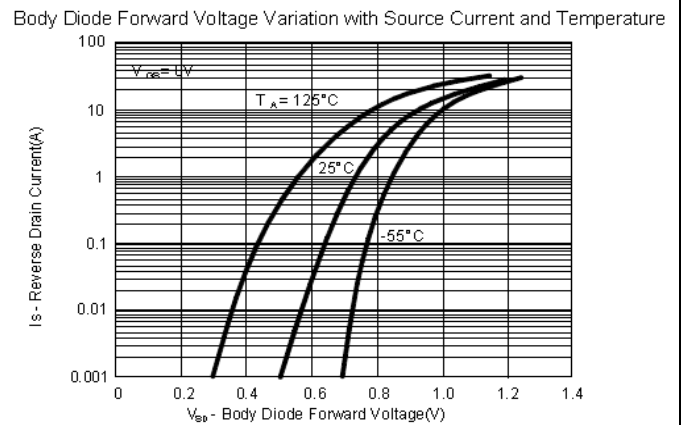
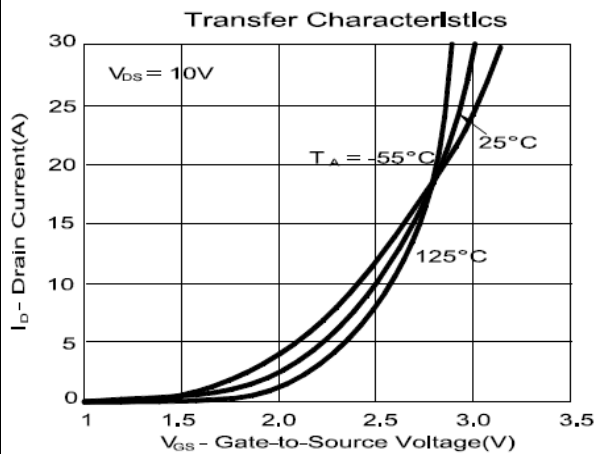
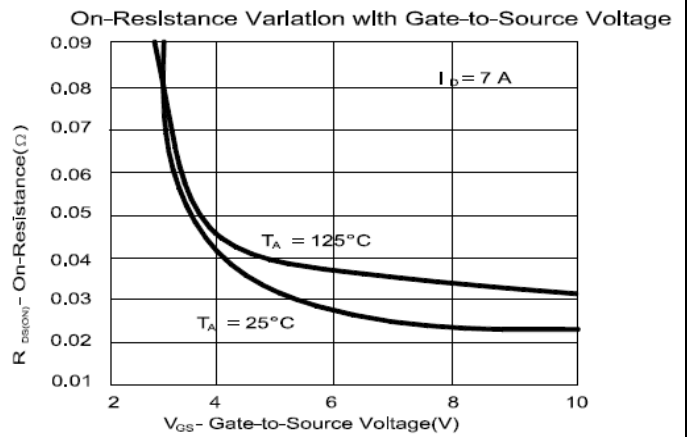
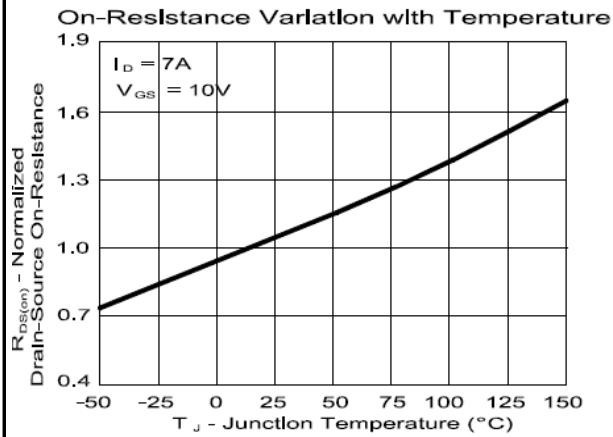
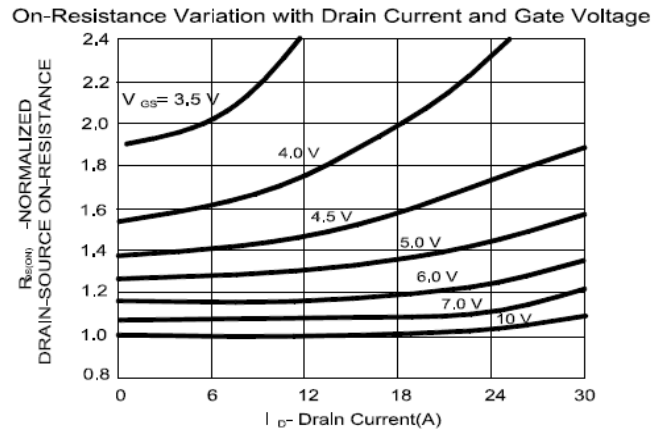
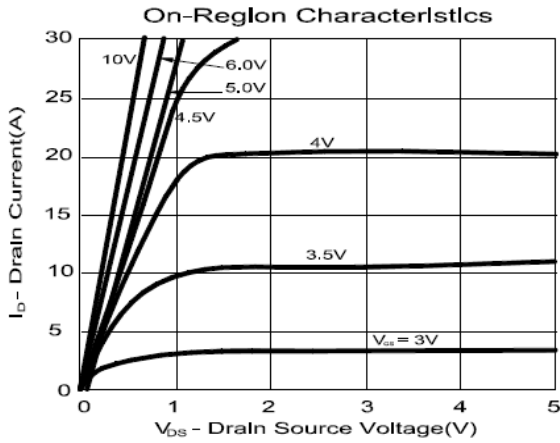
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Pulse width limited by maximum junction temperature.

# P5003QVG

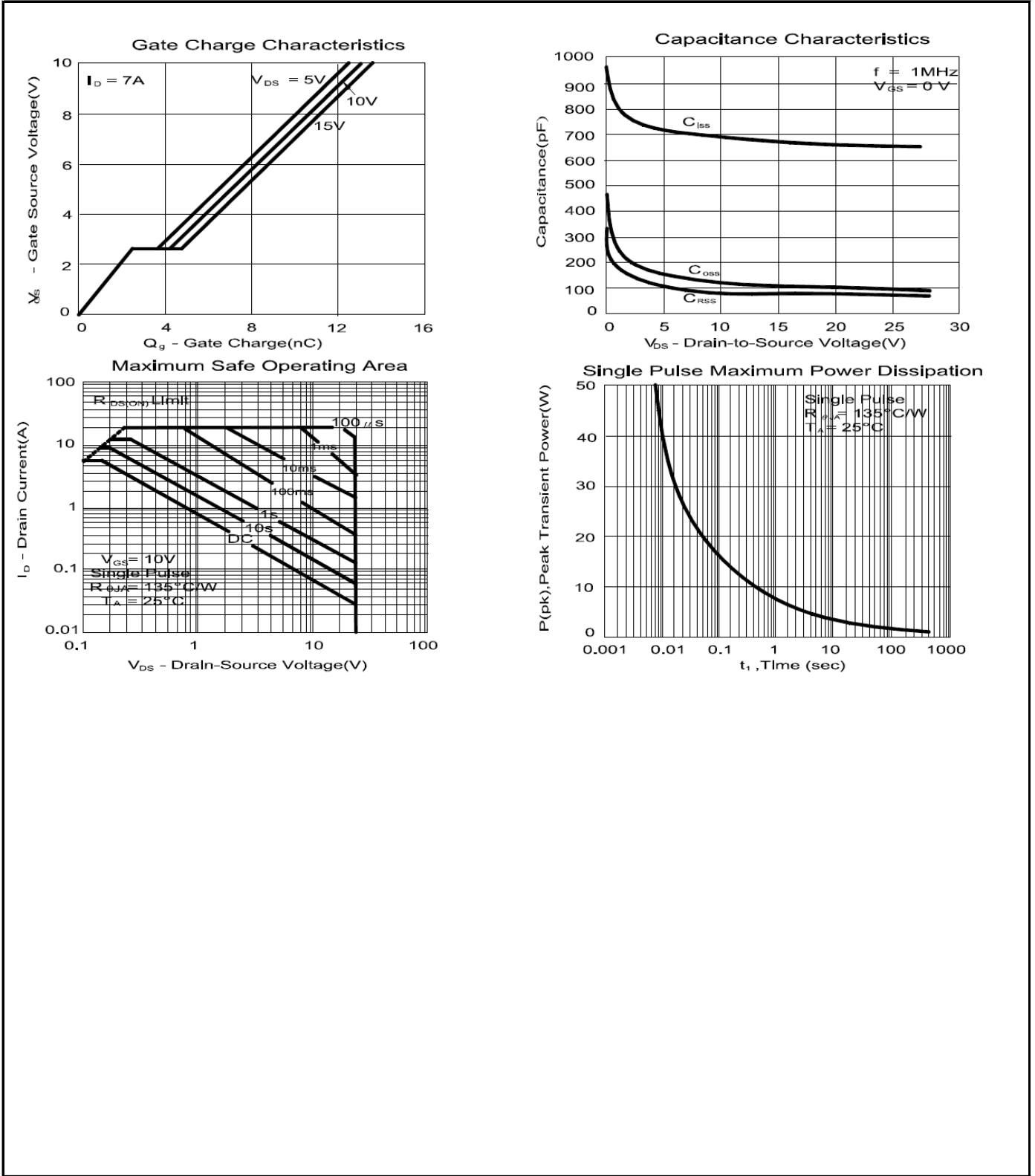
## N&P-Channel Enhancement Mode MOSFET

### N-CHANNEL



# P5003QVG

## N&P-Channel Enhancement Mode MOSFET

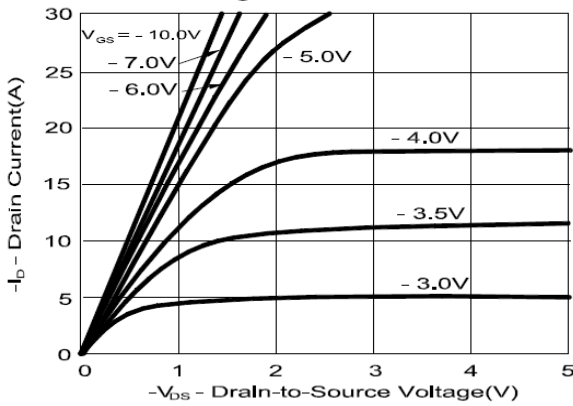


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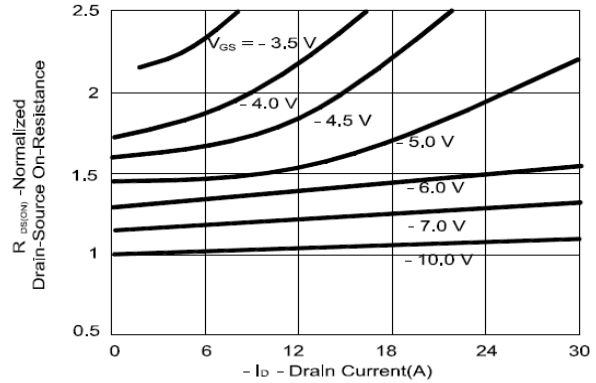
## N&P-Channel Enhancement Mode MOSFET

### P-CHANNEL

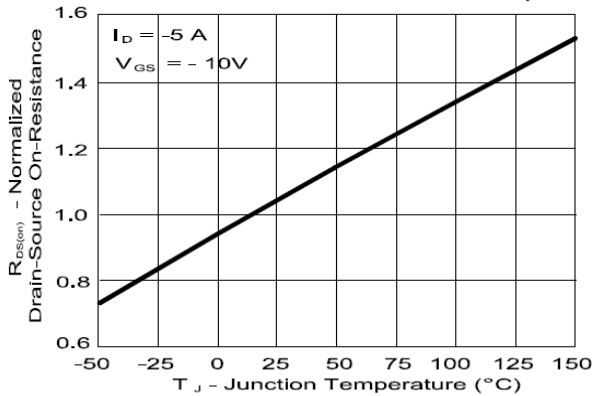
On-Region Characteristics



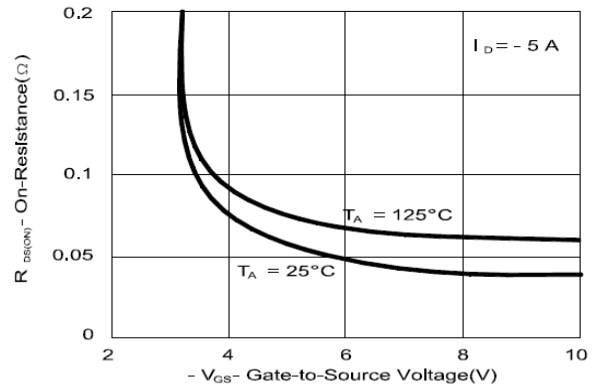
On-Resistance Variation with Drain Current and Gate Voltage



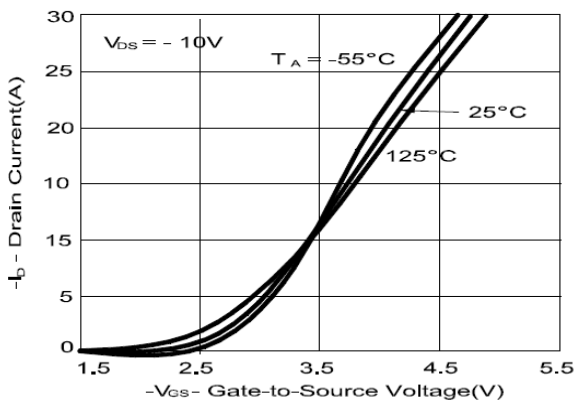
On-Resistance Variation with Temperature



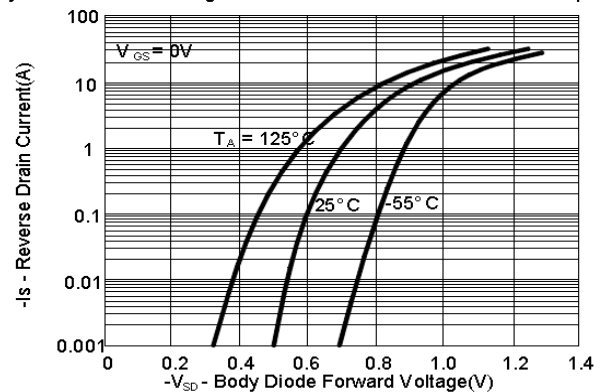
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics

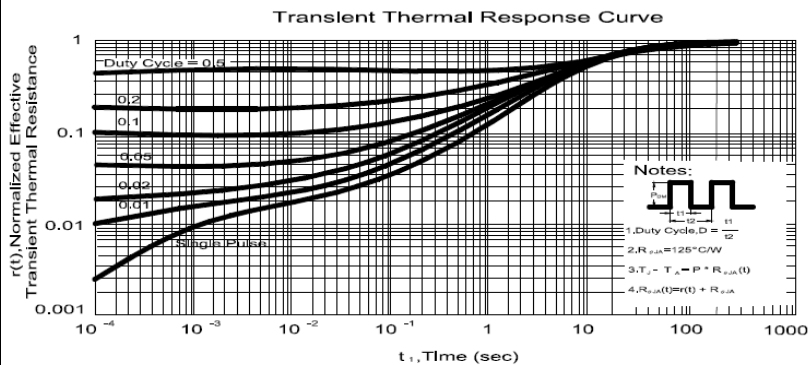
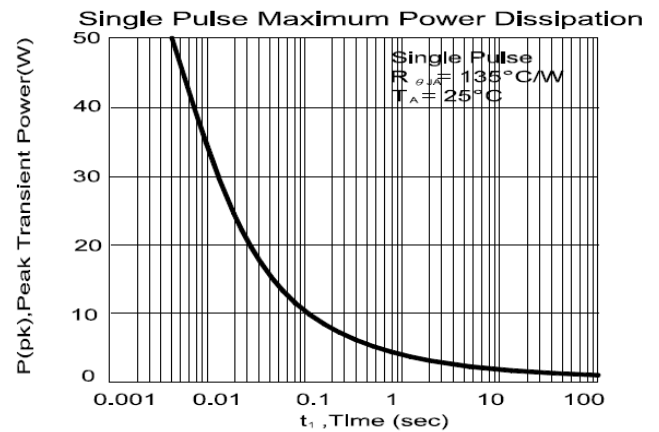
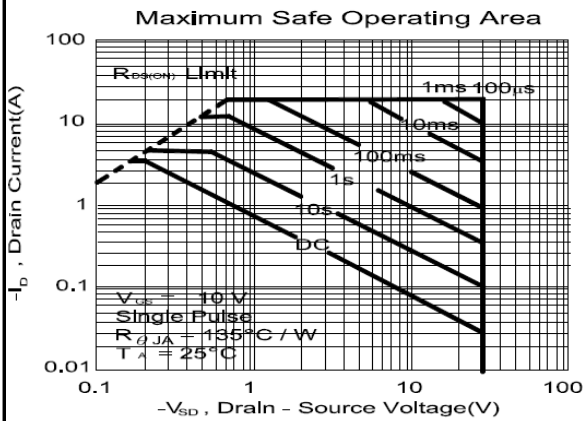
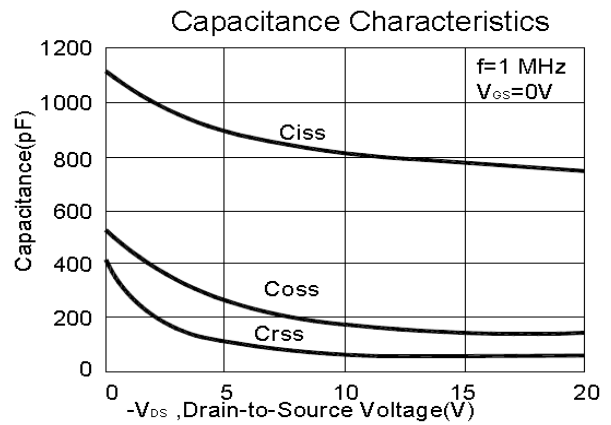
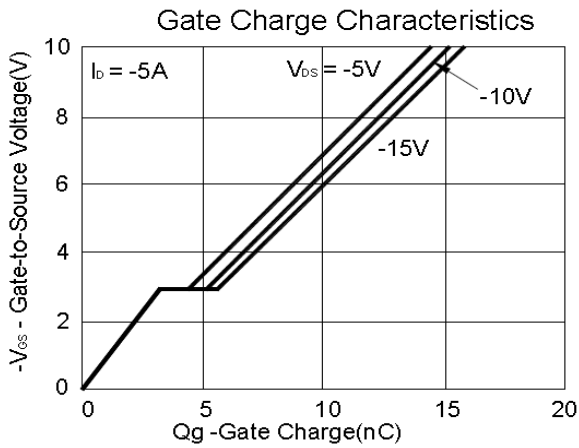


Body Diode Forward Voltage Variation with Source Current and Temperature



# P5003QVG

## N&P-Channel Enhancement Mode MOSFET



# P5003QVG

## N&P-Channel Enhancement Mode MOSFET

### Package Dimension

### SOP-8 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8	4.9	5.0	H	0.4	0.6	0.93
B	3.8	3.9	4.0	I	0.19	0.21	0.25
C	5.79	6.0	6.2	J	0.25	0.375	0.5
D	0.33	0.4	0.51	K	0°	3°	18°
E	1.25	1.27	1.29				
F	1.1	1.3	1.65				
G	0.05	0.15	0.25				

