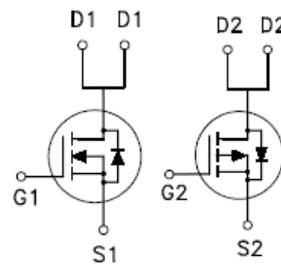
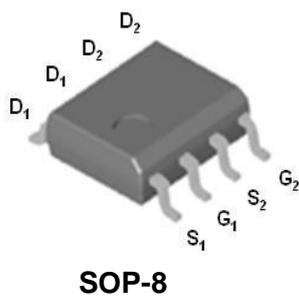


# P3304QV

## N&P-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$	Channel
40V	28m $\Omega$ @ $V_{GS} = 10V$	7A	N
-40V	33m $\Omega$ @ $V_{GS} = -10V$	-7A	P



### 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	40	V
			P	-40	
Gate-Source Voltage		$V_{GS}$	N	$\pm 20$	
			P	$\pm 20$	
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	$I_D$	N	7	A
			P	-7	
	$T_A = 70\text{ }^\circ\text{C}$		N	6	
			P	-6	
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	W
			P		
	$T_A = 70\text{ }^\circ\text{C}$		N	1.3	
			P		
Junction & Storage Temperature Range		$T_j, T_{stg}$		-55 to 150	$^\circ\text{C}$
Lead Temperature ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.)		$T_L$		275	

# P3304QV

## N&P-Channel Enhancement Mode MOSFET

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Lead	$R_{\theta JL}$		31	°C / W
Junction-to-Ambient	$R_{\theta JA}$	48	62.5	

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

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

### ELECTRICAL CHARACTERISTICS ( $T_J = 25\text{ }^\circ\text{C}$ , Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	CH.	LIMITS			UNITS
				MIN	TYP	MAX	
<b>STATIC</b>							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	N	40			V
		$V_{GS} = 0V, I_D = -250\mu A$	P	-40			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	N	1.0	2.0	3.0	V
		$V_{DS} = V_{GS}, I_D = -250\mu A$	P	-1.0	-2.0	-3.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	N			$\pm 100$	nA
		$V_{DS} = 0V, V_{GS} = \pm 20V$	P			$\pm 100$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 32V, V_{GS} = 0V$	N			1	$\mu A$
		$V_{DS} = -32V, V_{GS} = 0V$	P			-1	
		$V_{DS} = 30V, V_{GS} = 0V, T_J = 55\text{ }^\circ\text{C}$	N			10	
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 55\text{ }^\circ\text{C}$	P			-10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	N	20			A
		$V_{DS} = -5V, V_{GS} = -10V$	P	-20			
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = 5V, I_D = 6A$	N		30	42	m $\Omega$
		$V_{GS} = -5V, I_D = -5A$	P		44	50	
		$V_{GS} = 10V, I_D = 7A$	N		21	28	
		$V_{GS} = -10V, I_D = -7A$	P		28	33	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 10V, I_D = 7A$	N		19		S
		$V_{DS} = -10V, I_D = -7A$	P		18		

## P3304QV

### N&P-Channel Enhancement Mode MOSFET

DYNAMIC								
Input Capacitance	$C_{iss}$	N-Channel $V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	N		790	988	pF	
			P		1000	1260		
Output Capacitance	$C_{oss}$	P-Channel $V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	N		175	245		
			P		450	625		
Reverse Transfer Capacitance	$C_{rss}$	N-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V, I_D = 7A,$	N		16			nC
			P		20			
Total Gate Charge <sup>2</sup>	$Q_g$	P-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V, I_D = -7A$	N		2.5			
			P		3.2			
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	N-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V, I_D = 7A,$	N		2.1			
			P		2.7			
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$	P-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V, I_D = -7A$	N		2.2	4.4	nS	
			P		9.7	19.4		
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel $V_{DS} = 20V, I_D \cong 1A, V_{GS} = 10V, R_{GEN} = 6\Omega$	N		7.5	15		
			P		14	28.1		
Rise Time <sup>2</sup>	$t_r$	P-Channel $V_{DS} = -20V, I_D \cong -1A, V_{GS} = -10V, R_{GEN} = 6\Omega$	N		11.8	21.3		
			P		28.7	51.6		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$	N-Channel $V_{DS} = 20V, I_D \cong 1A, V_{GS} = 10V, R_{GEN} = 6\Omega$	N		3.7	7.4		
			P		17.8	32.2		
Fall Time <sup>2</sup>	$t_f$	P-Channel $V_{DS} = -20V, I_D \cong -1A, V_{GS} = -10V, R_{GEN} = 6\Omega$	N		3.7	7.4		
			P		17.8	32.2		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ( $T_J = 25^\circ C$ )								
Continuous Current	$I_S$		N			1.3	A	
			P			-1.3		
Pulsed Current <sup>3</sup>	$I_{SM}$		N			2.6		
			P			-2.6		
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = I_S, V_{GS} = 0V$	N			1	V	
		$I_F = I_S, V_{GS} = 0V$	P			-1		

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

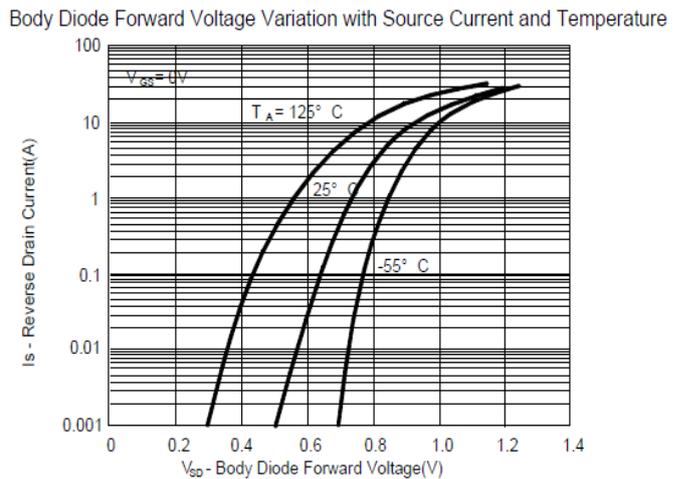
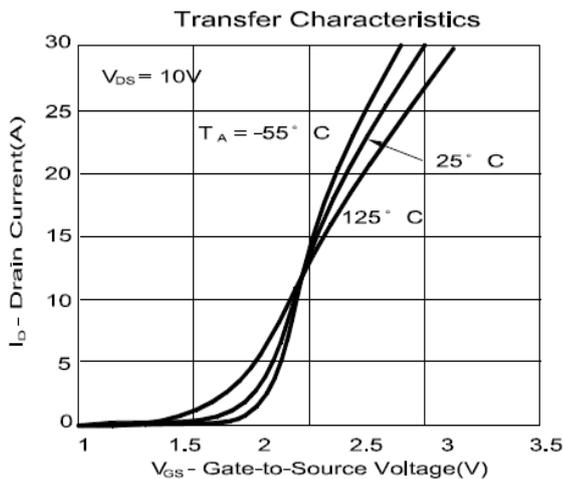
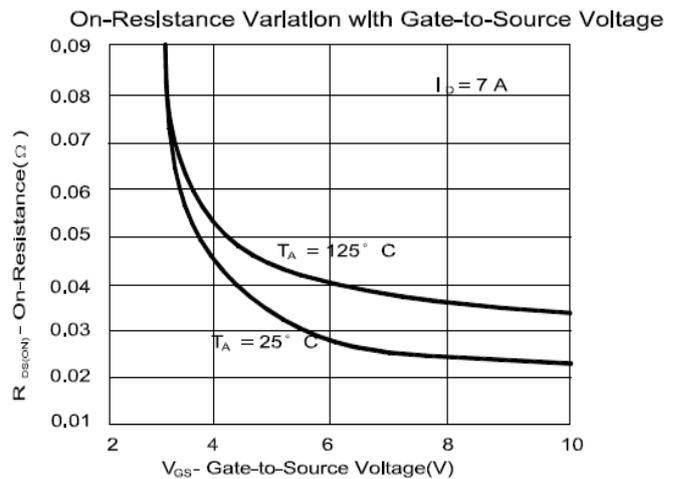
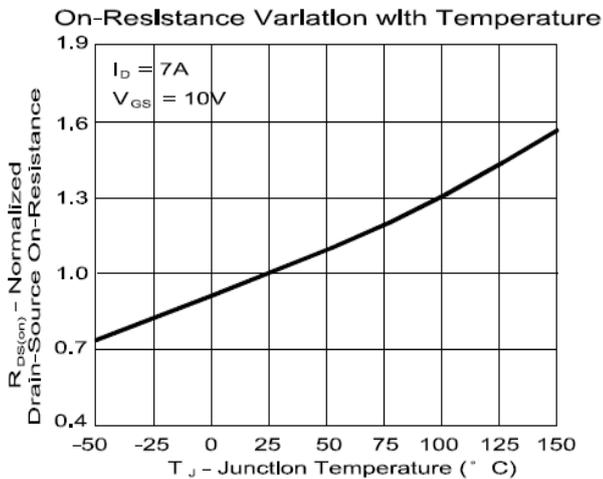
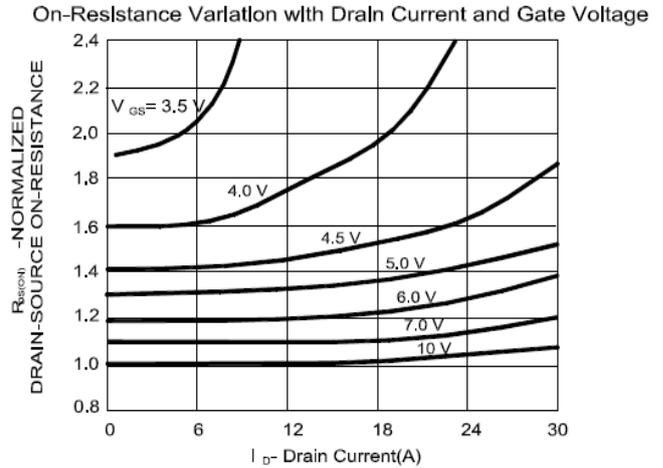
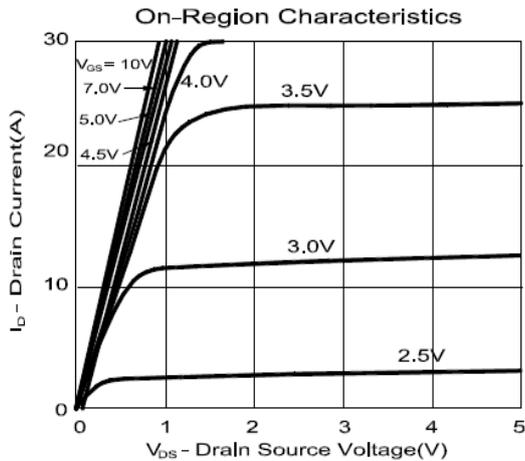
<sup>2</sup>Independent of operating temperature.

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

# P3304QV

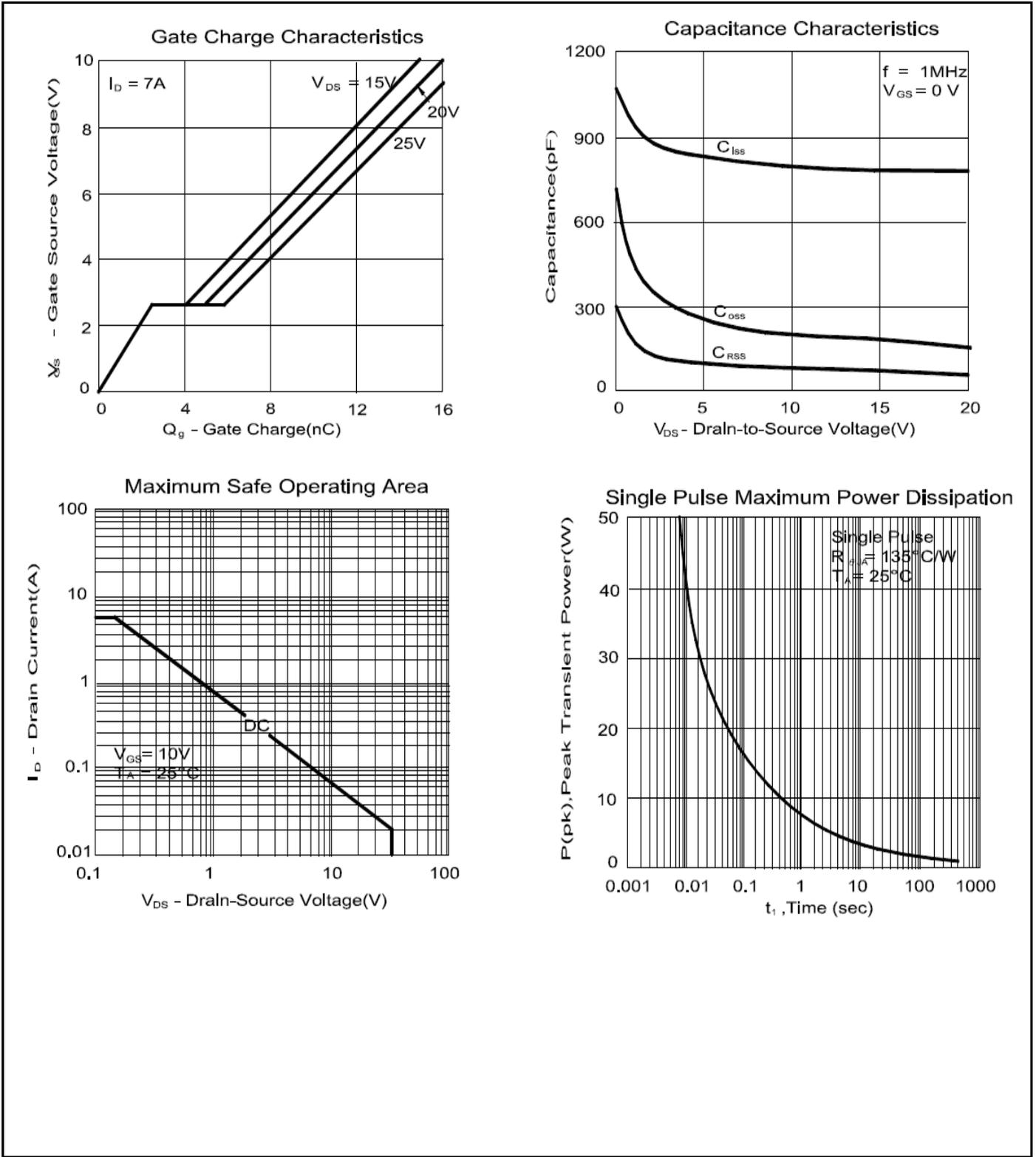
## N&P-Channel Enhancement Mode MOSFET

### N-CHANNEL



# P3304QV

## N&P-Channel Enhancement Mode MOSFET

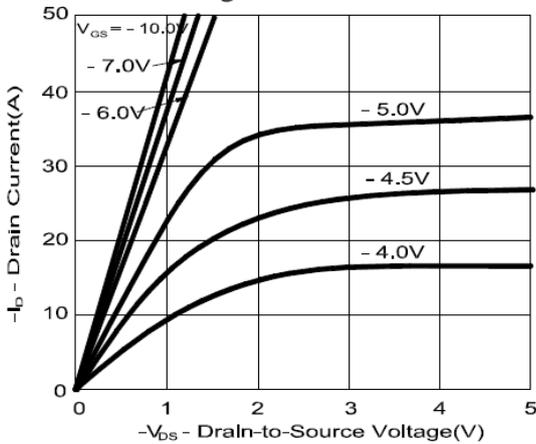


# P3304QV

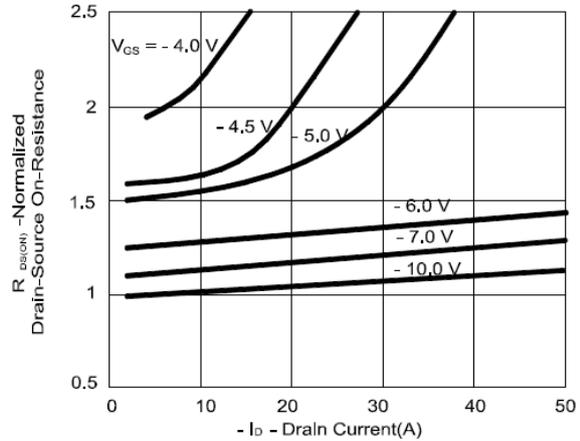
## N&P-Channel Enhancement Mode MOSFET

### P-CHANNEL

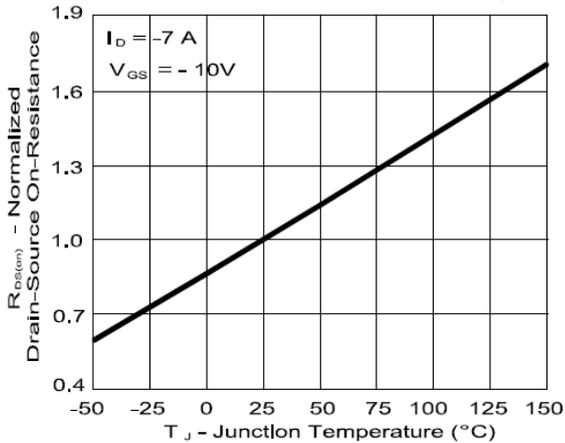
On-Region Characteristics



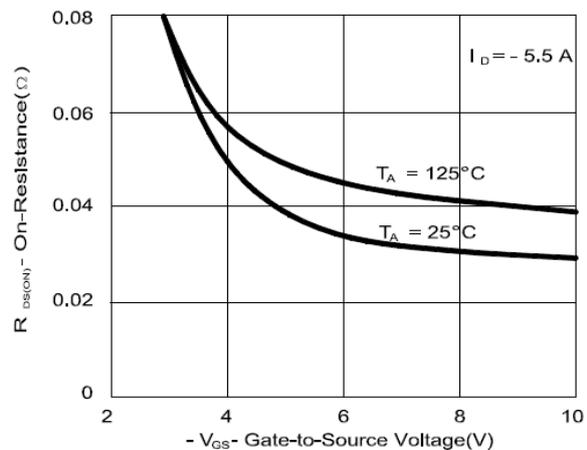
On-Resistance Variation with Drain Current and Gate Voltage



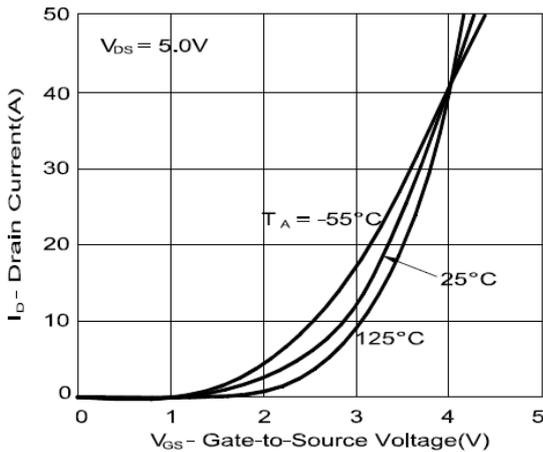
On-Resistance Variation with Temperature



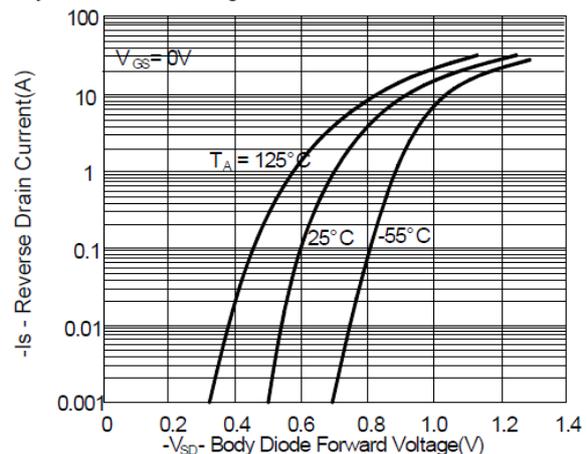
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics

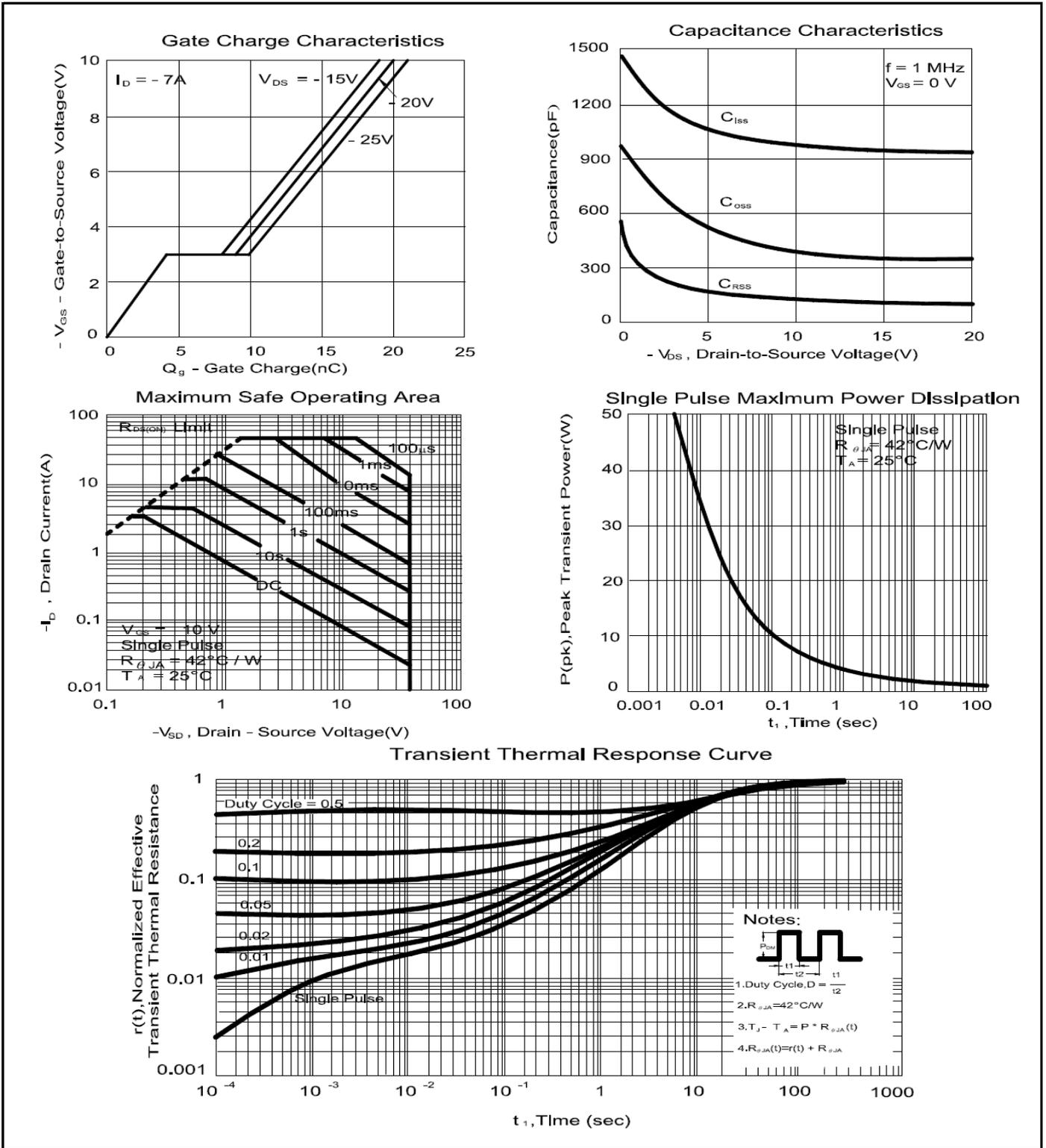


Body Diode Forward Voltage Variation with Source Current and Temperature



# P3304QV

## N&P-Channel Enhancement Mode MOSFET



# P3304QV

## 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				

