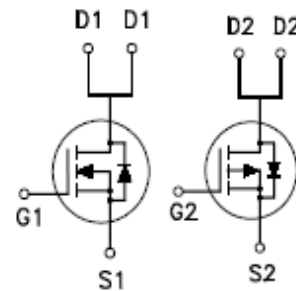
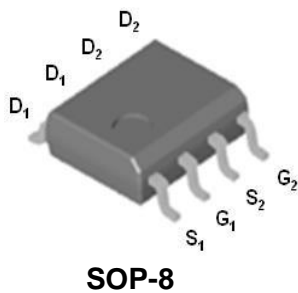


# P2503NVG

## N&P-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$	Channel
30V	25m $\Omega$ @ $V_{GS} = 10V$	7A	N
-30V	45m $\Omega$ @ $V_{GS} = -10V$	-5A	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	30	V
			P	-30	
Gate-Source Voltage		$V_{GS}$	N	$\pm 20$	V
			P	$\pm 20$	
Continuous Drain Current <sup>2</sup>	$T_A = 25\text{ }^\circ\text{C}$	$I_D$	N	7	A
			P	-5	
	$T_A = 70\text{ }^\circ\text{C}$		N	5	
			P	-4	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	N	30	A
			P	-30	
Avalanche Current		$I_{AS}$	N	20	A
			P	-20	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	N	20	mJ
			P	20	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	$P_D$	N	2	W
			P	1.7	
	$T_A = 70\text{ }^\circ\text{C}$		N	1.3	
			P	1	
Junction & Storage Temperature Range		$T_j, T_{stg}$		-55 to 150	$^\circ\text{C}$

# P2503NVG

## N&P-Channel Enhancement Mode MOSFET

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	Device	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$	N-ch		63	°C / W
		P-ch		70	

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

<sup>2</sup>Limited only by maximum temperature allowed.

<sup>3</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

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

PARAMETER	SYMBOL	TEST CONDITIONS	CH.	LIMITS			UNITS
				MIN	TYP	MAX	
<b>STATIC</b>							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	N	30			V
		$V_{GS} = 0V, I_D = -250\mu\text{A}$	P	-30			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	N	1	1.5	2.5	V
		$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	P	-1	-1.5	-2.5	
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	$I_{DSS}$	$V_{DS} = 24V, V_{GS} = 0V$	N			1	$\mu\text{A}$
		$V_{DS} = -24V, V_{GS} = 0V$	P			-1	
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 55^\circ\text{C}$	N			10	
		$V_{DS} = -20V, V_{GS} = 0V, T_J = 55^\circ\text{C}$	P			-10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	N	30			A
		$V_{DS} = -5V, V_{GS} = -10V$	P	-30			
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 6A$	N		25	37	m $\Omega$
		$V_{GS} = -4.5V, I_D = -4A$	P		58	80	
		$V_{GS} = 10V, I_D = 7A$	N		18	25	
		$V_{GS} = -10V, I_D = -5A$	P		34	45	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 7A$	N		19		S
		$V_{DS} = -5V, I_D = -5A$	P		11		

## P2503NVG

### N&P-Channel Enhancement Mode MOSFET

DYNAMIC						
Input Capacitance	$C_{iss}$	N-Channel $V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$	N		431	pF
			P		672	
Output Capacitance	$C_{oss}$	P-Channel $V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$	N		107	
			P		108	
Reverse Transfer Capacitance	$C_{rss}$		N		83	
			P		98	
Gate Resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	N		2.3	$\Omega$
			P		7.6	
Total Gate Charge <sup>2</sup>	$Q_g$	N-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 7A,$	N		11	nC
			P		15	
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	P-Channel $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -5A$	N		2	
			P		2.2	
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$		N		4	
			P		4.3	
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel $V_{DS} = 15V$ $I_D \cong 7A, V_{GS} = 10V, R_{GEN} = 6\Omega$	N		2.2	nS
			P		6.7	
Rise Time <sup>2</sup>	$t_r$	P-Channel $V_{DS} = -15V,$ $I_D \cong -5A, V_{GS} = -10V, R_{GEN} = 6\Omega$	N		7.5	
			P		9.7	
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$		N		11.8	
			P		19.8	
Fall Time <sup>2</sup>	$t_f$		N		3.7	
			P		12.3	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ( $T_J = 25^\circ C$ )						
Continuous Current	$I_S$		N		7	A
			P		-5	
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 7A, V_{GS} = 0V$	N		1	V
		$I_F = -5A, V_{GS} = 0V$	P		-1	
Reverse Recovery Time	$t_{rr}$	N-Channel $I_F = 7A, di_F/dt = 100A / \mu S$ P-Channel $I_F = -5A, di_F/dt = 100A / \mu S$	N		11.2	nS
			P		13	
Reverse Recovery Charge	$Q_{rr}$		N		4	nC
			P		5	

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

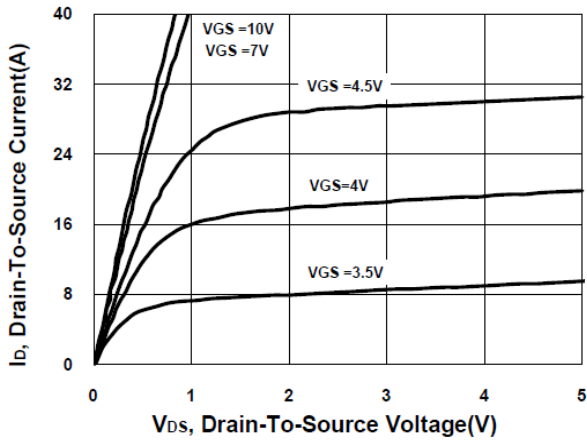
<sup>2</sup>Independent of operating temperature.

# P2503NVG

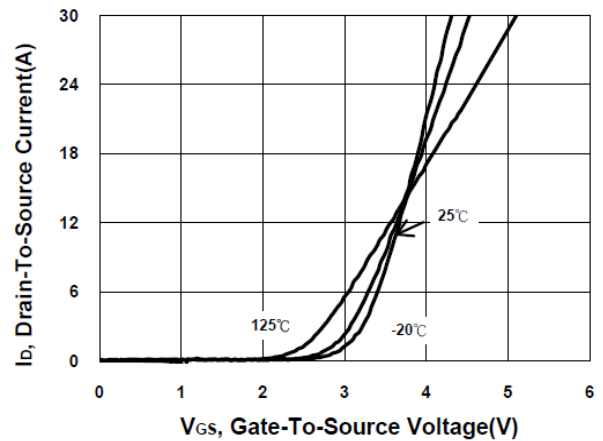
## N&P-Channel Enhancement Mode MOSFET

### N-CHANNEL

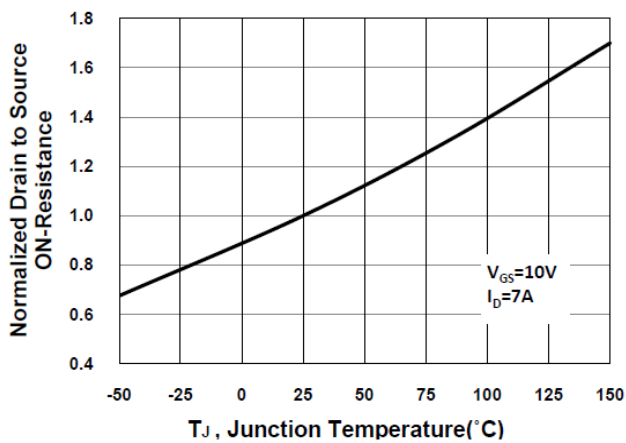
**Output Characteristics**



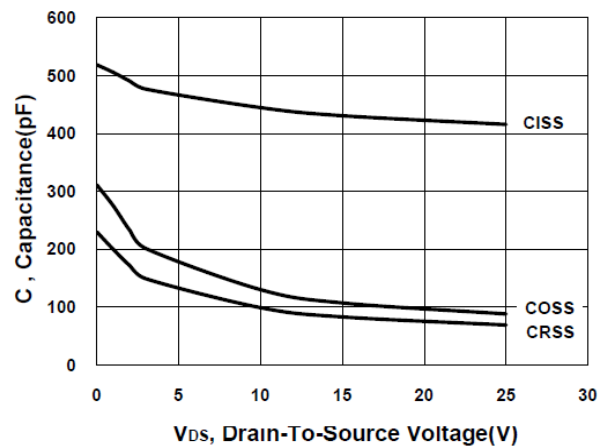
**Transfer Characteristics**



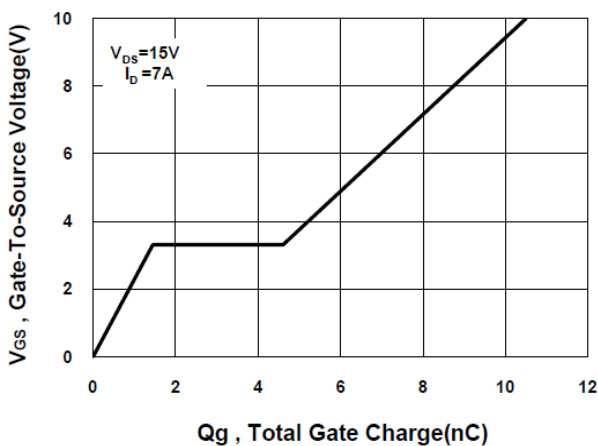
**On-Resistance VS Temperature**



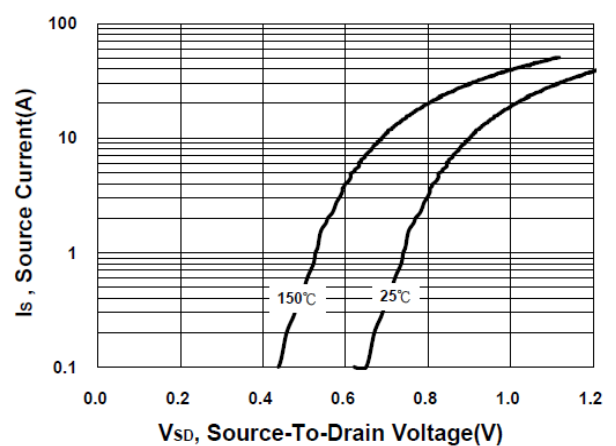
**Capacitance Characteristic**



**Gate charge Characteristics**



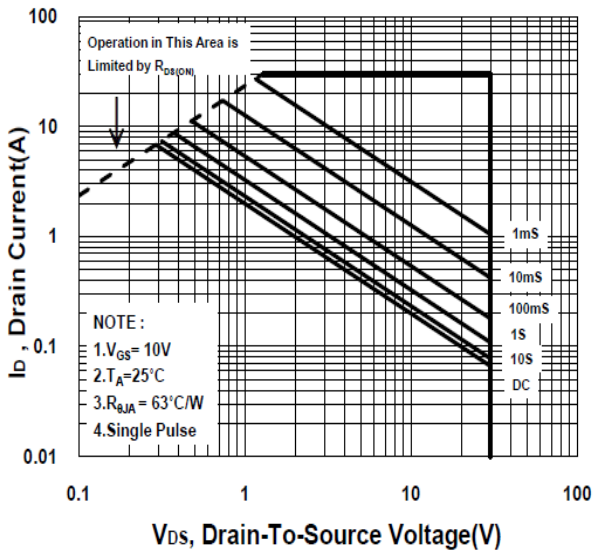
**Source-Drain Diode Forward Voltage**



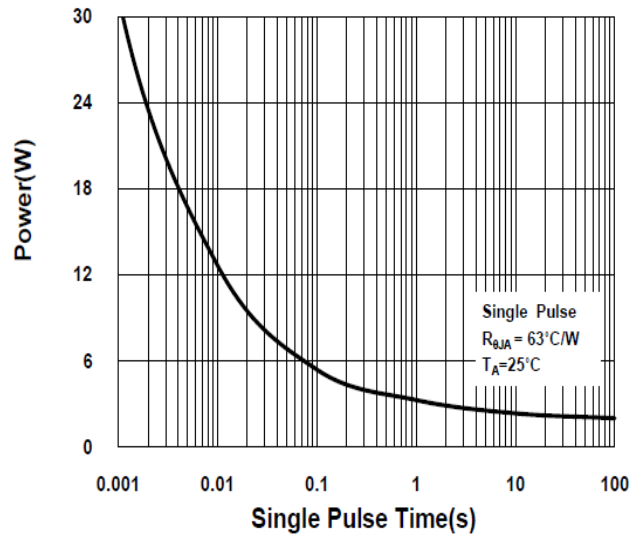
# P2503NVG

## N&P-Channel Enhancement Mode MOSFET

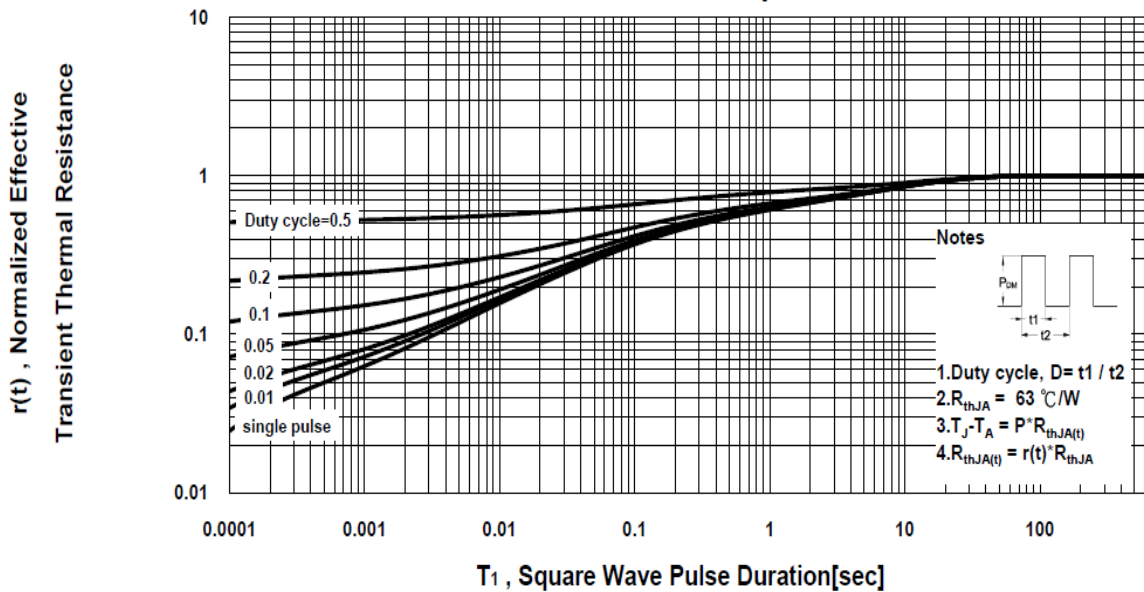
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

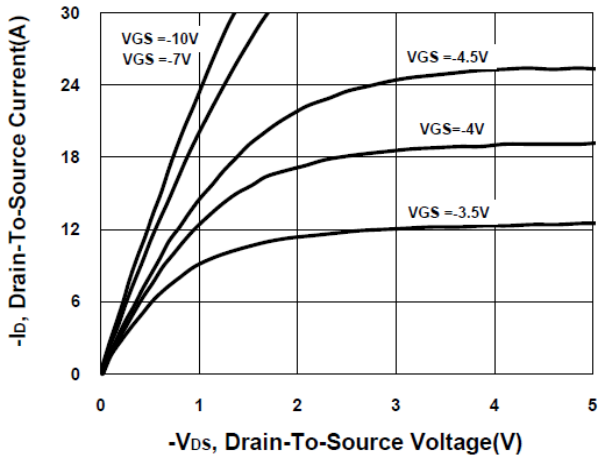


# P2503NVG

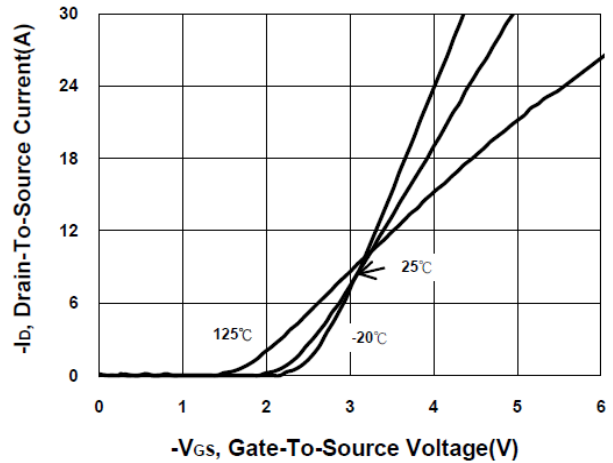
## N&P-Channel Enhancement Mode MOSFET

### P-CHANNEL

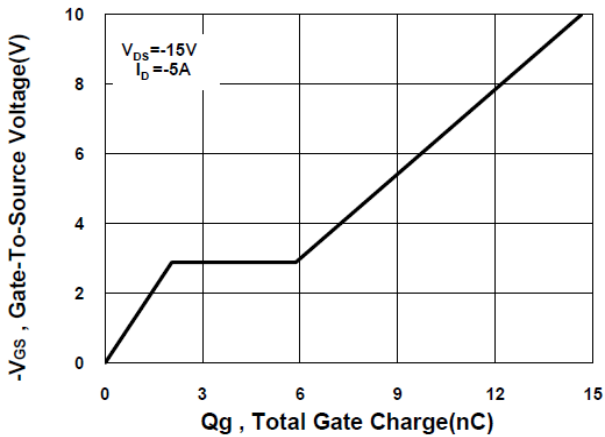
**Output Characteristics**



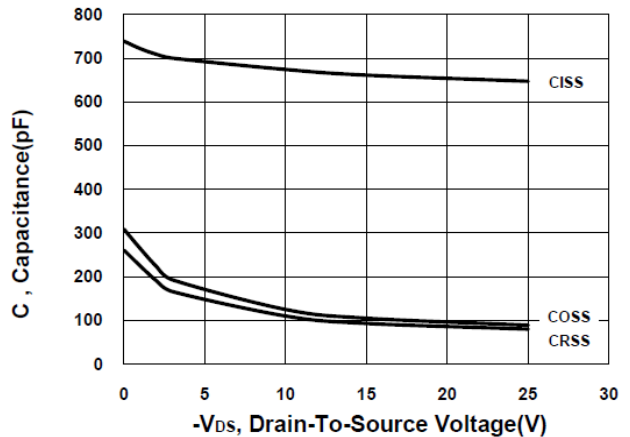
**Transfer Characteristics**



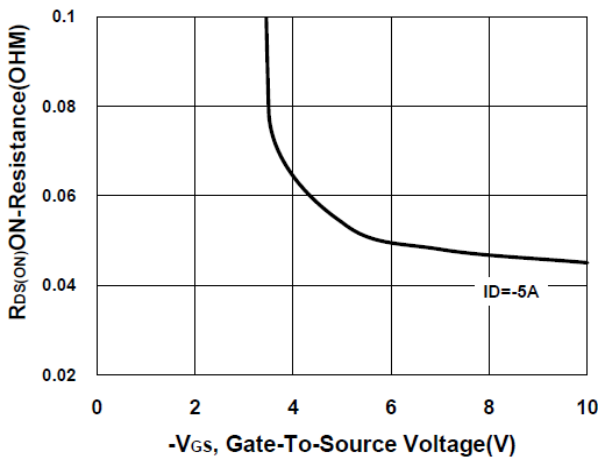
**Gate charge Characteristics**



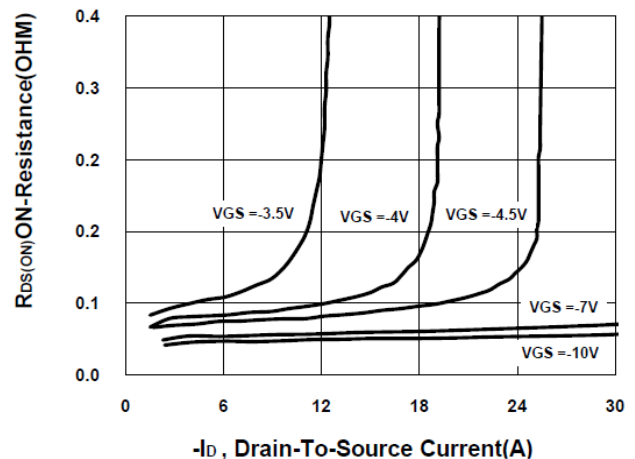
**Capacitance Characteristic**



**On-Resistance VS Temperature**



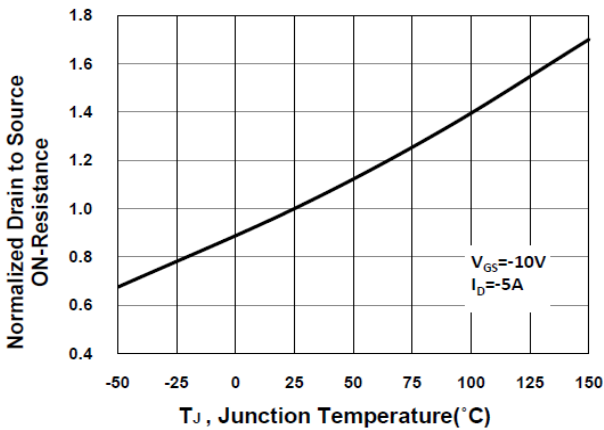
**On-Resistance VS Drain Current**



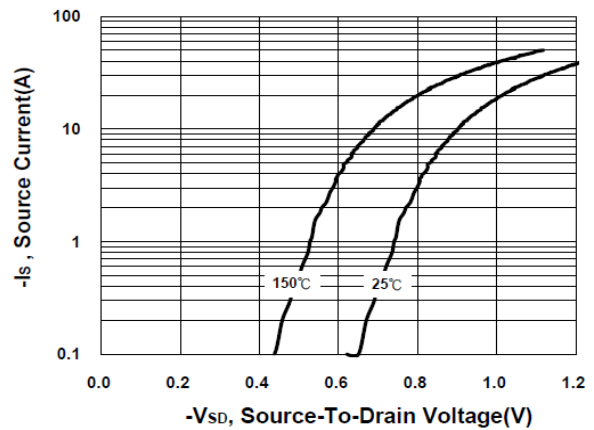
# P2503NVG

## N&P-Channel Enhancement Mode MOSFET

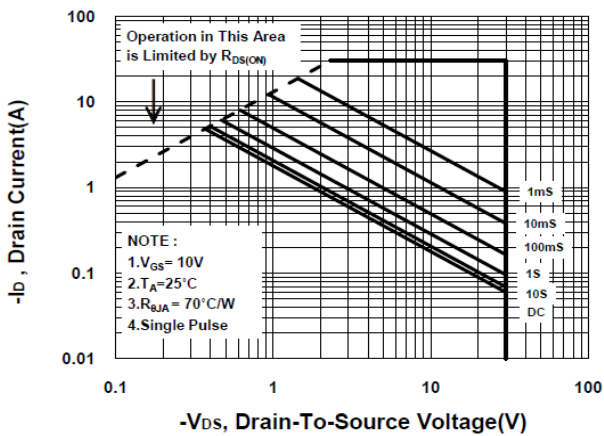
**On-Resistance VS Gate-To-Source**



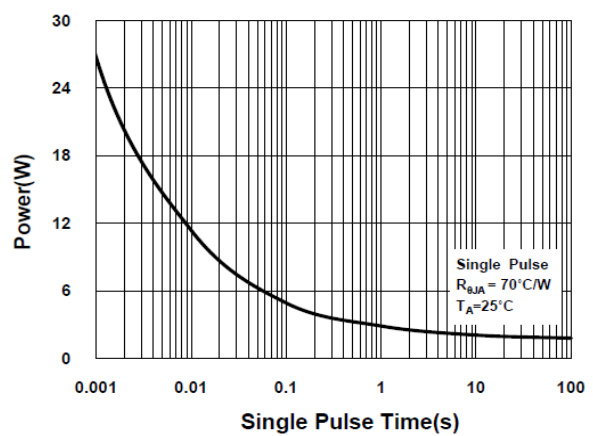
**Source-Drain Diode Forward Voltage**



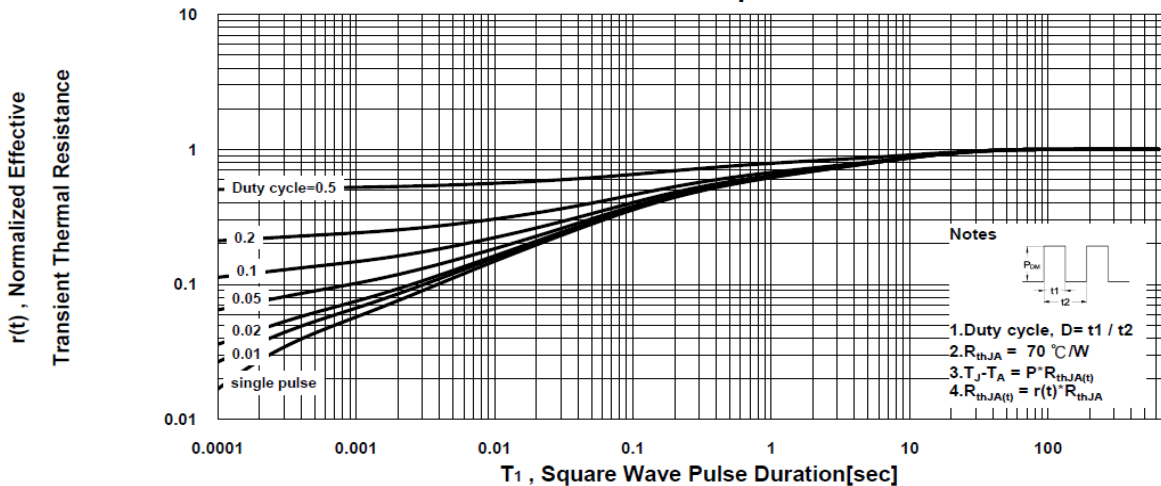
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



# P2503NVG

## 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				

