NIKO-SEM

N- & P-Channel Enhancement Mode Field Effect Transistor

P2103NVG

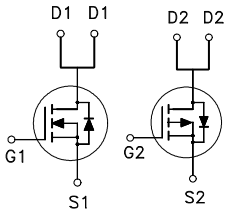
SOP-8

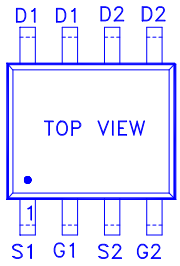
Halogen-Free & Lead-Free

RoHS Compliant

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
N-Channel	30	21mΩ	8A
P-Channel	-30	34mΩ	-6A





G : GATE
D : DRAIN
S : SOURCE

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	N-Channel	P-Channel	UNITS
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A = 25 °C	I_D	8	-6	A
	T_A = 70 °C		6	-5	
Pulsed Drain Current[1]		I_{DM}	36	-27	
Avalanche Current		I_{AS}	26	-27	
Avalanche Energy	L = 0.1mH	E_{AS}	35	38	mJ
Power Dissipation	T_A = 25 °C	P_D	2		W
	T_A = 70 °C		1.3		
Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

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

[1]Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	N-Ch	30			V
		V_{GS} = 0V, I_D = -250μA	P-Ch	-30			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	N-Ch	1	1.7	2.5	
		V_{DS} = V_{GS}, I_D = -250μA	P-Ch	-1	-1.6	-2.5	

Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	N-Ch			±100	nA
		V_{DS} = 0V, V_{GS} = ±20V	P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	N-Ch			1	µA
		V_{DS} = -24V, V_{GS} = 0V	P-Ch			-1	
		V_{DS} = 20V, V_{GS} = 0V, T_J = 55 °C	N-Ch			10	
		V_{DS} = -20V, V_{GS} = 0V, T_J = 55 °C	P-Ch			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	N-Ch	36			A
		V_{DS} =-5V, V_{GS} = -10V	P-Ch	-27			
Drain-Source On-State esistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 6A	N-Ch		19	31	mΩ
		V_{GS} = -4.5V, I_D = -5A	P-Ch		40	56	
		V_{GS} = 10V, I_D = 7A	N-Ch		14	21	
		V_{GS} = -10V, I_D = -6A	P-Ch		28	34	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 5A	N-Ch		14		S
		V_{DS} = -10V, I_D = -5A	P-Ch		8		

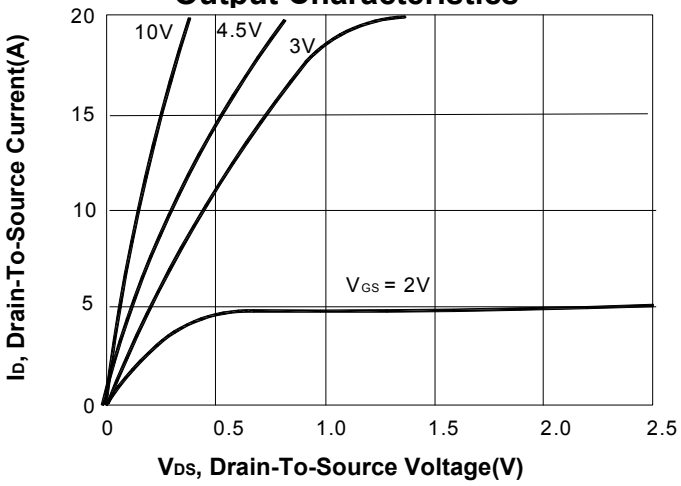
DYNAMIC							
Input Capacitance	C_{iss}	N-Channel V_{GS} = 0V, V_{DS} = 10V, f = 1MHz P-Channel V_{GS} = 0V, V_{DS} = -10V, f = 1MHz	N-Ch		659		pF
			P-Ch		983		
Output Capacitance	C_{oss}		N-Ch		218		
			P-Ch		216		
Reverse Transfer Capacitance	C_{rss}		N-Ch		138		
			P-Ch		157		
Total Gate Charge[2]	Q_g	N-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 7A P-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D = -6A	N-Ch		16		nC
			P-Ch		21		
Gate-Source Charge[2]	Q_{gs}		N-Ch		2		
			P-Ch		3		
Gate-Drain Charge[2]	Q_{gd}		N-Ch		5		
			P-Ch		4		

Turn-On Delay Time[2]	$t_{d(on)}$	N-Channel V_{DS} = 15V $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 6Ω P-Channel V_{DS} = -15V, $I_D \cong$ -1A, V_{GS} = -10V, R_{GEN} = 6Ω	N-Ch P-Ch		9 10		nS
Rise Time[2]	t_r		N-Ch P-Ch		11 15		
Turn-Off Delay Time[2]	$t_{d(off)}$		N-Ch P-Ch		18 68		
Fall Time[2]	t_f		N-Ch P-Ch		20 34		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current	I_S		N-Ch P-Ch			2 -2	A
Forward Voltage[1]	V_{SD}	I_F = 5A, V_{GS} = 0V I_F = -5A, V_{GS} = 0V	N-Ch P-Ch			1 -1	V
Reverse Recovery Time	t_{rr}	I_F = 5A, dI_F/dt = 100A / µS I_F = -5A, dI_F/dt = 100A / µS	N-Ch P-Ch		15.5 15.5		nS
Reverse Recovery Charge	Q_{rr}		N-Ch P-Ch		7.9 7.9		nC

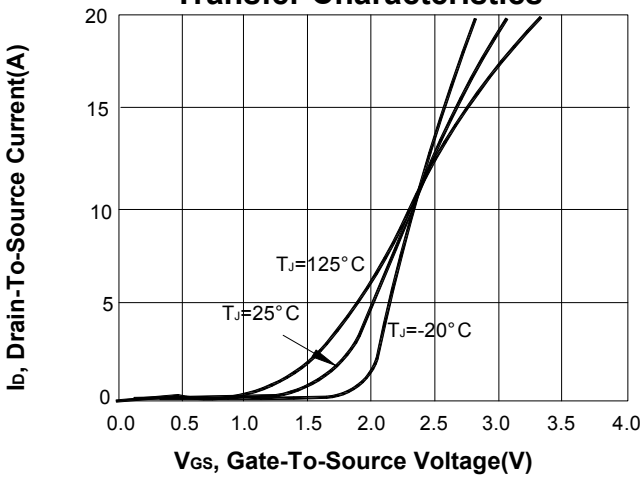
[1]Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

TYPICAL PERFORMANCE CHARACTERISTICS
N-CHANNEL

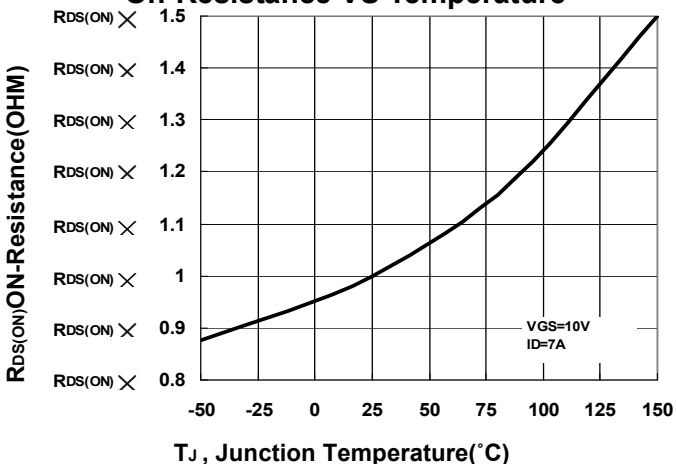
Output Characteristics



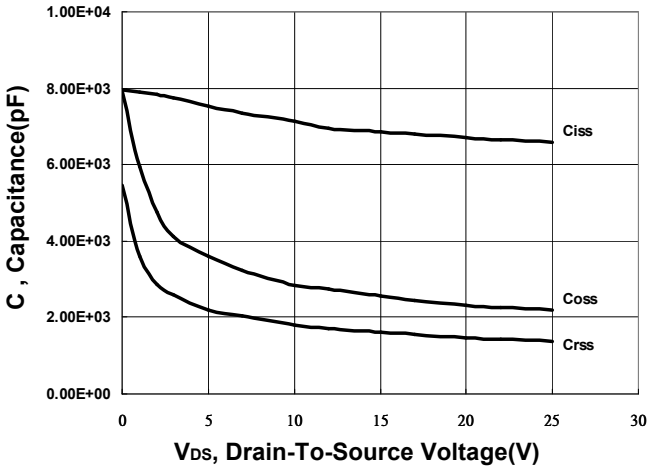
Transfer Characteristics



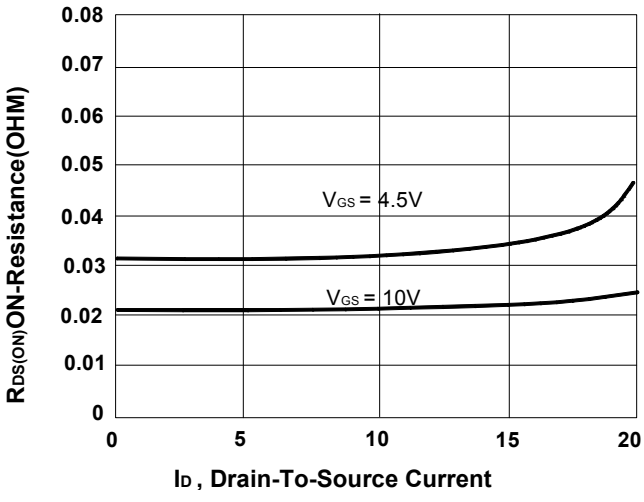
On-Resistance VS Temperature



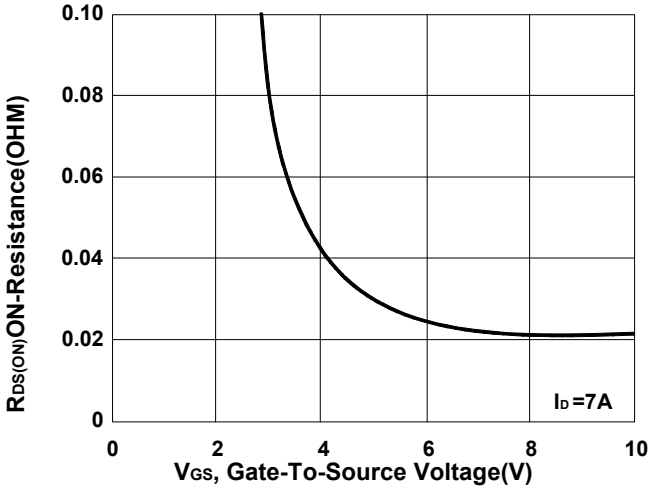
Capacitance Characteristic



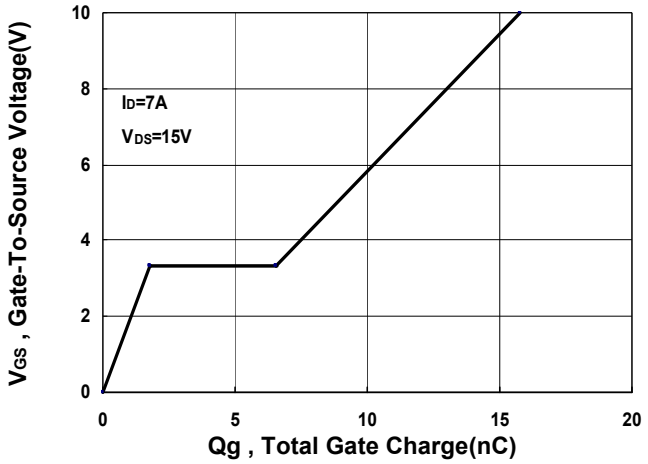
On-Resistance VS Drain Current



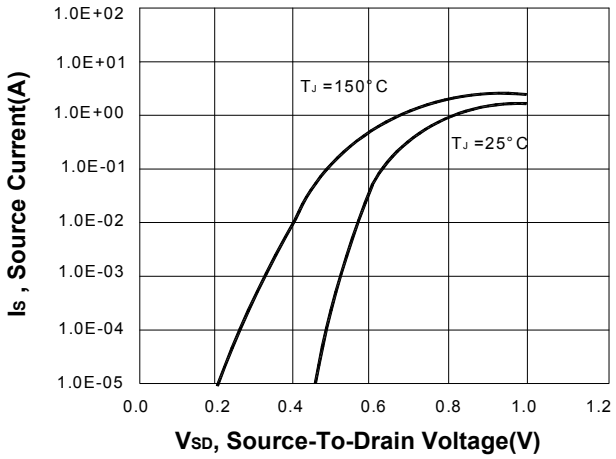
On-Resistance VS Gate-To-Source



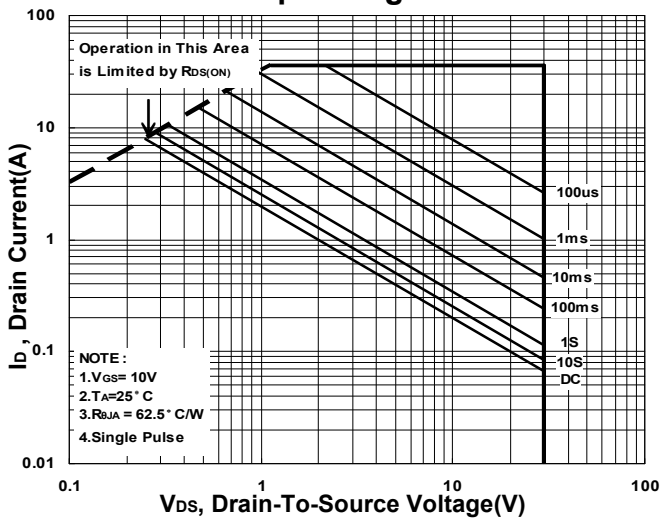
Gate charge Characteristics



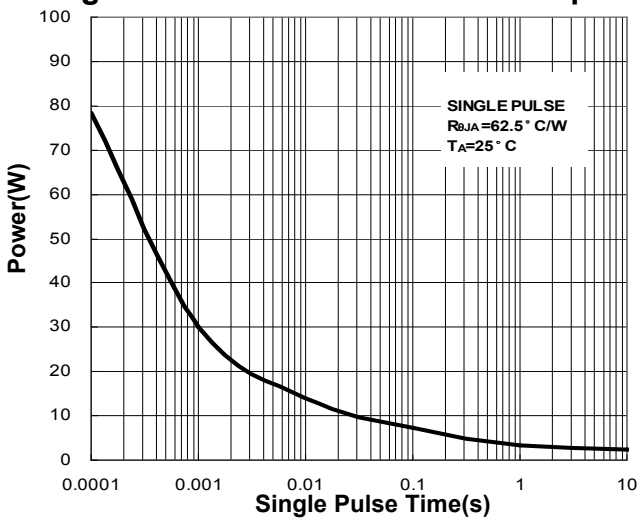
Source-Drain Diode Forward Voltage



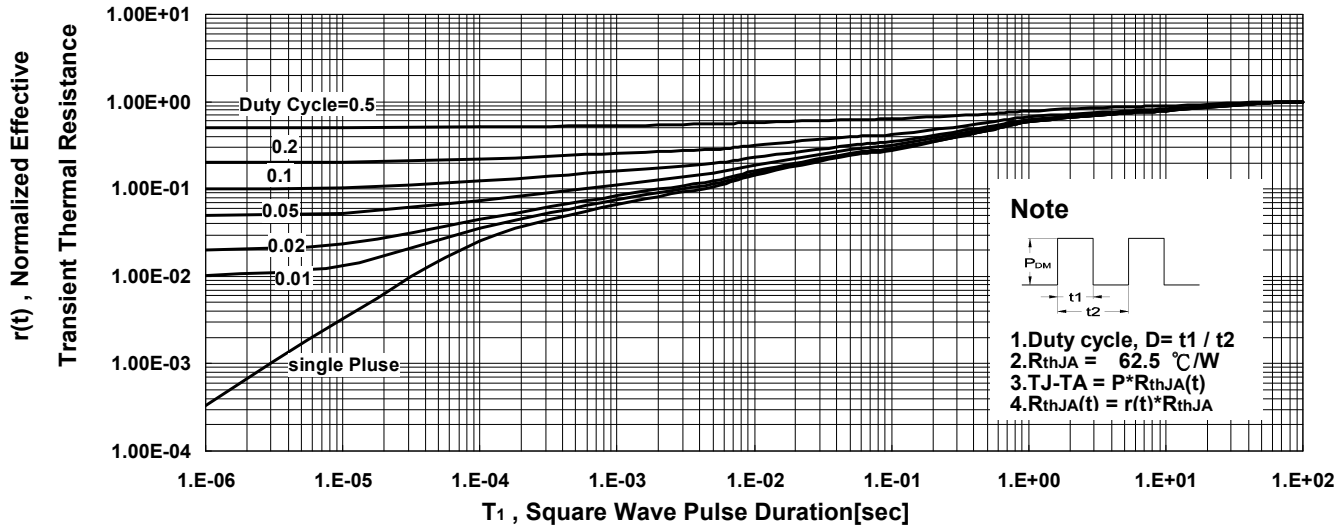
Safe Operating Area



Single Pulse Maximum Power Dissipation

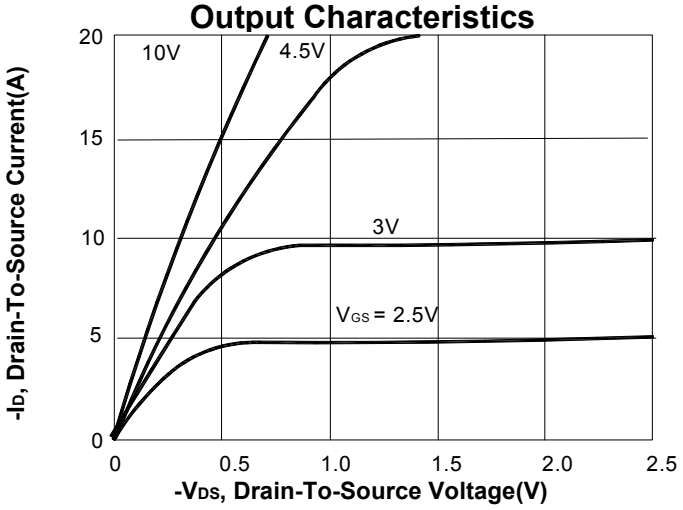


Transient Thermal Response Curve

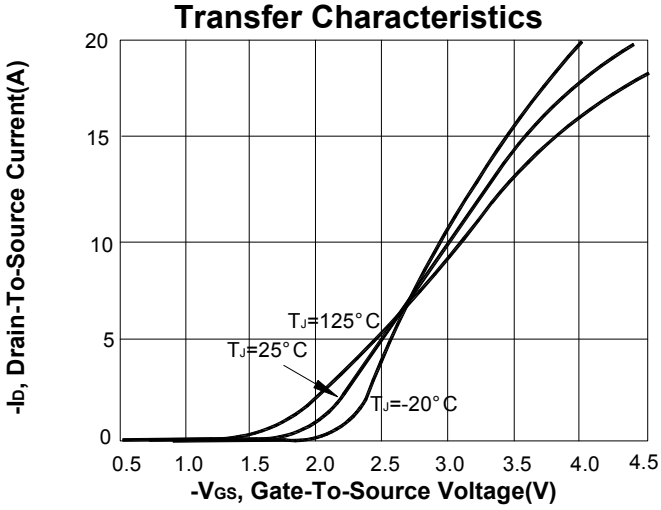


TYPICAL PERFORMANCE CHARACTERISTICS
P-CHANNEL

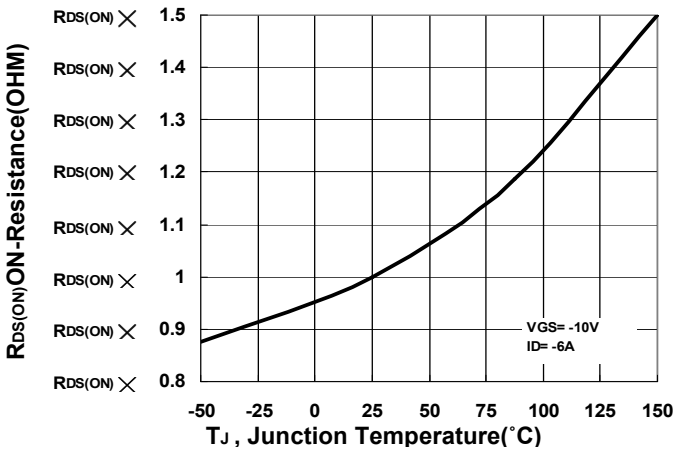
Output Characteristics



Transfer Characteristics



On-Resistance VS Temperature



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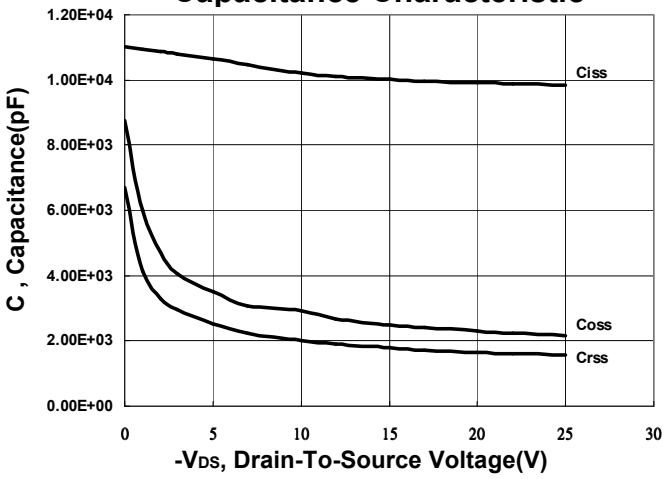
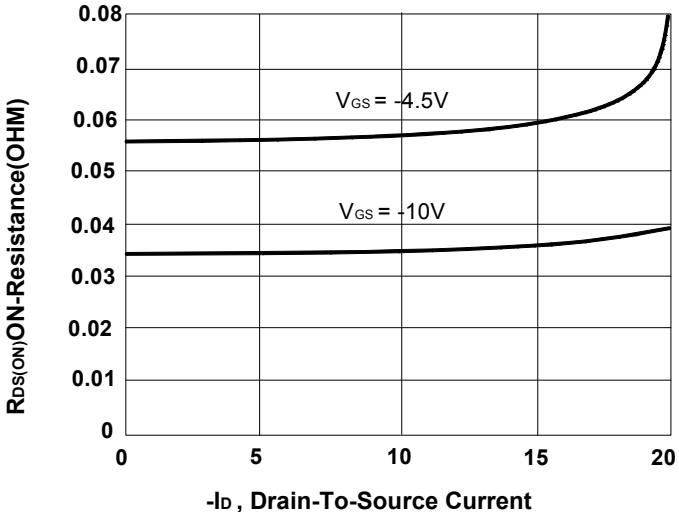
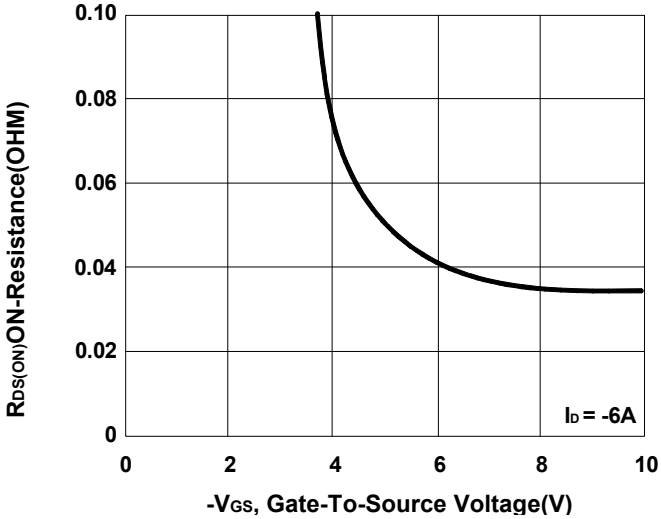


On-Resistance VS Drain Current



On-Resistance VS Gate-To-Source



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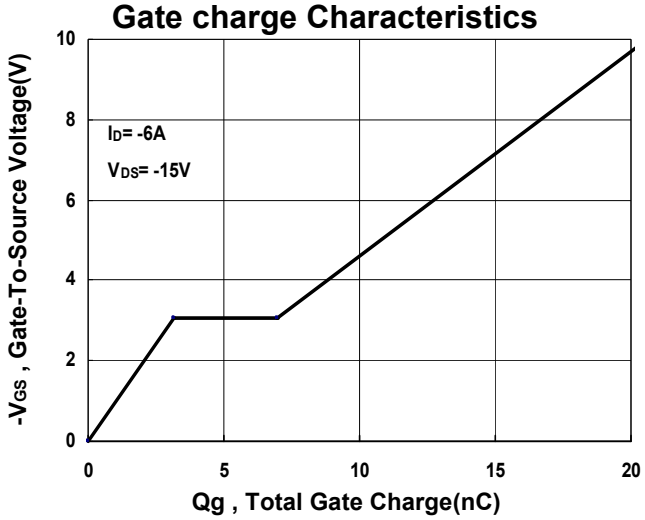

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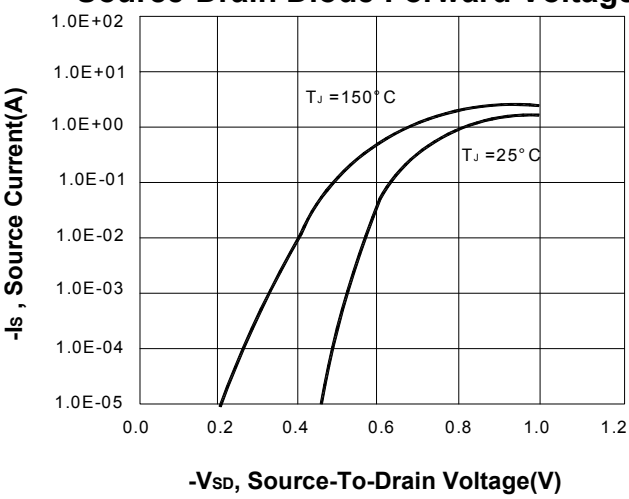

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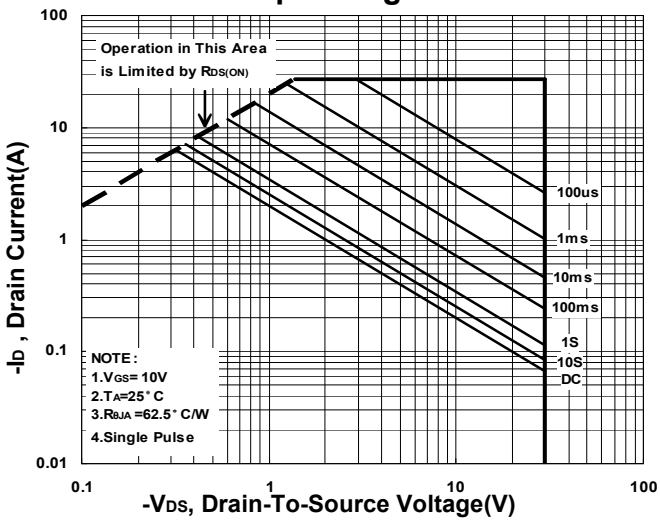

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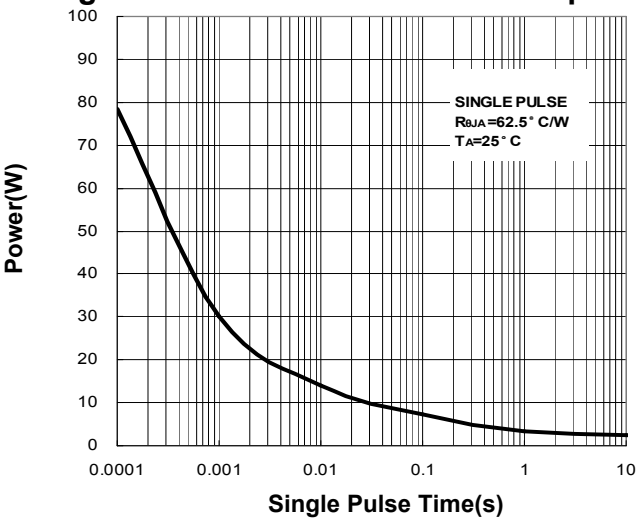

Transient Thermal Response Curve