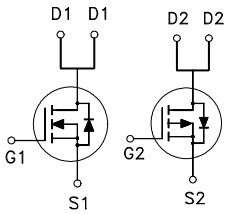
NIKO-SEM

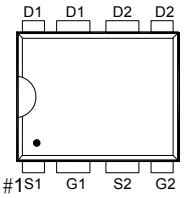
N- & P-Channel Enhancement Mode Field Effect Transistor

P5806NPG
DIP-8
Halogen-Free & Lead-Free

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
N-Channel	60	58mΩ	4.5A
P-Channel	-60	90mΩ	-3.5A





RoHS Compliant

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}	60	-60	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A = 25 °C	I_D	4.5	-3.5	A
	T_A = 70 °C		4	-3	
Pulsed Drain Current[1]		I_{DM}	20	-20	
Power Dissipation	T_A = 25 °C	P_D	2		W
	T_A = 70 °C		1.28		
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
Junction-to-Case	$R_{\theta JC}$		40	°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	60			V
		V_{GS} = 0V, I_D = -250μA	P-Ch	-60			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	N-Ch	1.0	1.5	2.5	
		V_{DS} = V_{GS}, I_D = -250μA	P-Ch	-1.0	-1.5	-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} = 48V, V_{GS} = 0V	N-Ch			1	μA
		V_{DS} = -48V, V_{GS} = 0V	P-Ch			-1	
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C	N-Ch			10	
		V_{DS} = -40V, 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	20			A
		V_{DS} =-5V, V_{GS} = -10V	P-Ch	-20			
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 4A	N-Ch		55	85	mΩ
		V_{GS} = -4.5V, I_D = -3A	P-Ch		100	135	
		V_{GS} = 10V, I_D = 4.5A	N-Ch		42	58	
		V_{GS} = -10V, I_D = -3.5A	P-Ch		70	90	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 4.5A	N-Ch		14		S
		V_{DS} = -5V, I_D = -3.5A	P-Ch		9		

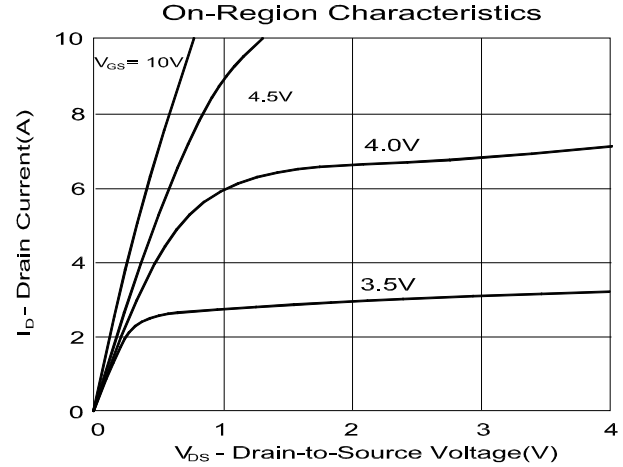
DYNAMIC							
Input Capacitance	C_{iss}	N-Channel V_{GS} = 0V, V_{DS} = 25V, f = 1MHz P-Channel V_{GS} = 0V, V_{DS} = -30V, f = 1MHz	N-Ch		650		pF
			P-Ch		630		
Output Capacitance	C_{oss}		N-Ch		80		
			P-Ch		81		
Reverse Transfer Capacitance	C_{rss}		N-Ch		35		
			P-Ch		33		
Total Gate Charge[2]	Q_g	N-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 4.5A P-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D = -3.5A	N-Ch		12	16	nC
			P-Ch		11	15	
Gate-Source Charge[2]	Q_{gs}		N-Ch		2.4		
			P-Ch		2.1		
Gate-Drain Charge[2]	Q_{gd}		N-Ch		2.6		
			P-Ch		2.5		
Turn-On Delay Time[2]	$t_{d(on)}$	N-Channel V_{DD} = 30V $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 6Ω P-Channel V_{DD} = -30V $I_D \cong$ -1A, V_{GS} = -10V, R_{GEN} = 6Ω	N-Ch		11	20	nS
			P-Ch		6	13	
Rise Time[2]	t_r		N-Ch		8	18	
			P-Ch		8	18	
Turn-Off Delay Time[2]	$t_{d(off)}$		N-Ch		19	35	
			P-Ch		17	31	
Fall Time[2]	t_f		N-Ch		6	15	
			P-Ch		11	20	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current	I_S		N-Ch			2	A
			P-Ch			-2	
Forward Voltage[1]	V_{SD}	$I_F = I_S$, V_{GS} = 0V	N-Ch			1	V
		$I_F = I_S$, V_{GS} = 0V	P-Ch			-1	

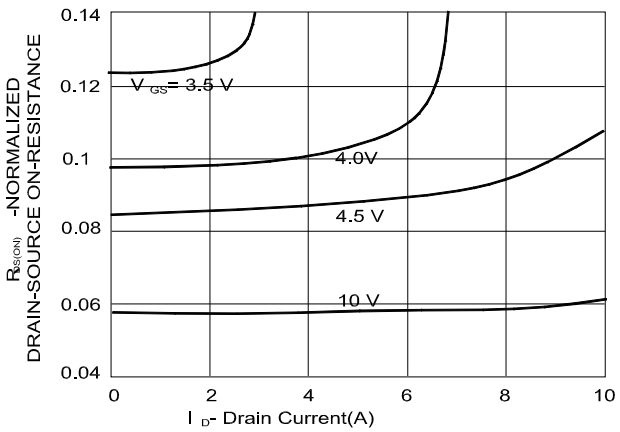
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

N-CHANNEL

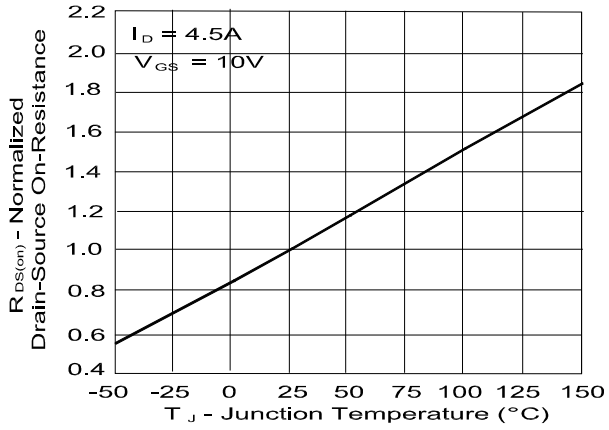
On-Region Characteristics



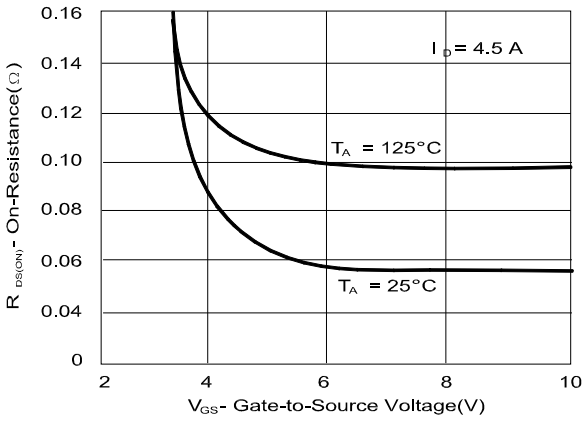
On-Resistance Variation with Drain Current and Gate Voltage



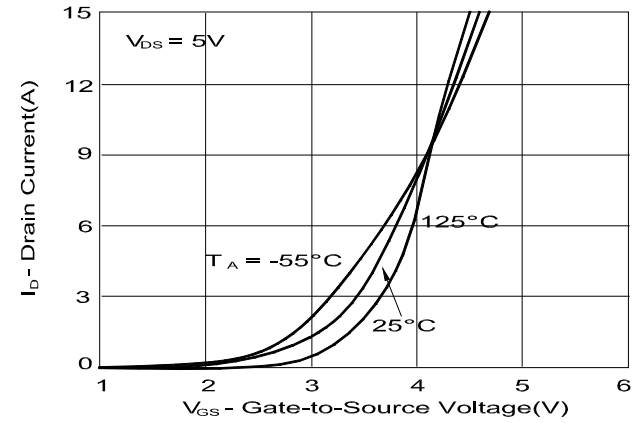
On-Resistance Variation with Temperature



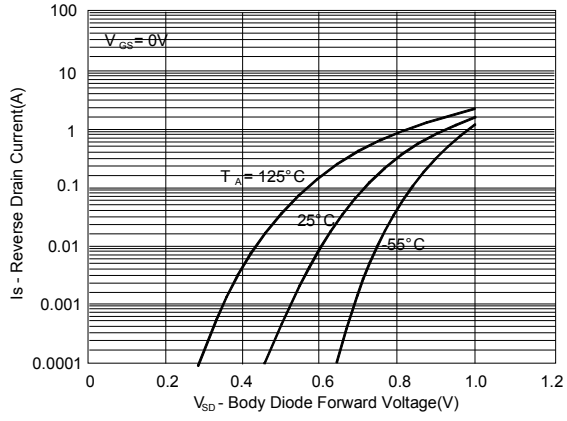
On-Resistance Variation with Gate-to-Source Voltage



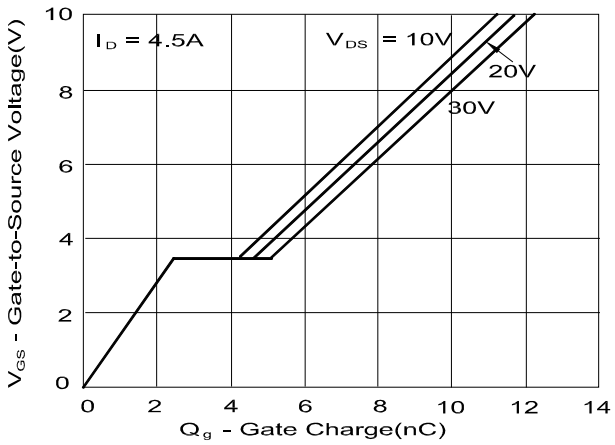
Transfer Characteristics



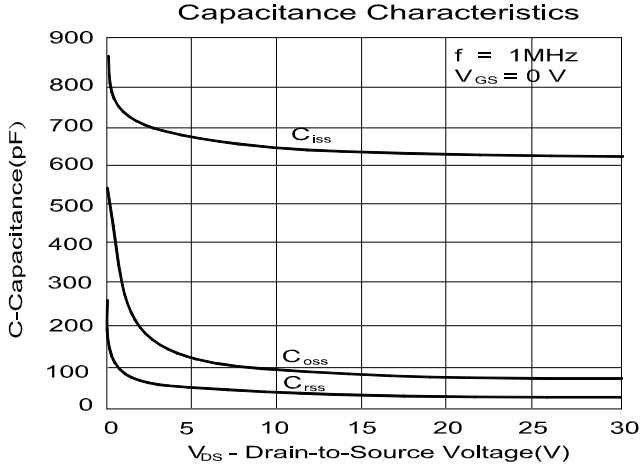
Body Diode Forward Voltage Variation with Source Current and Temperature



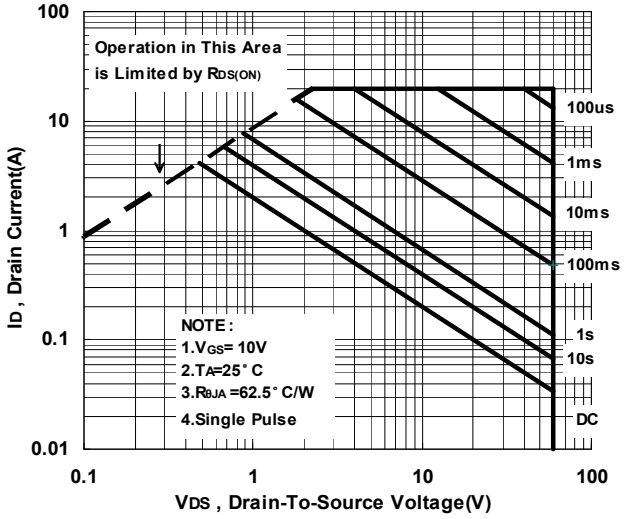
Gate Charge Characteristics



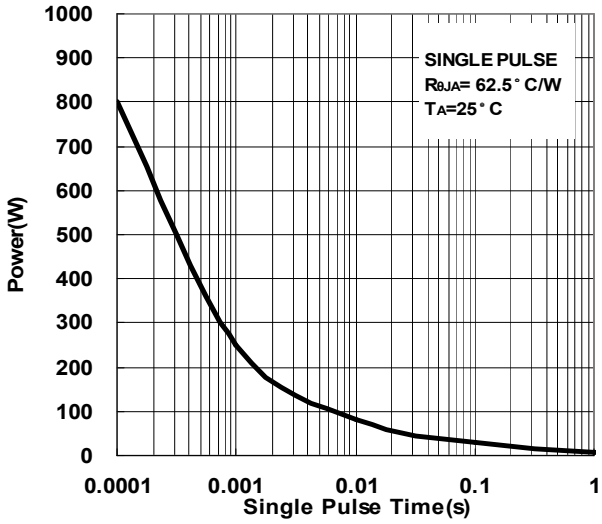
Capacitance Characteristics



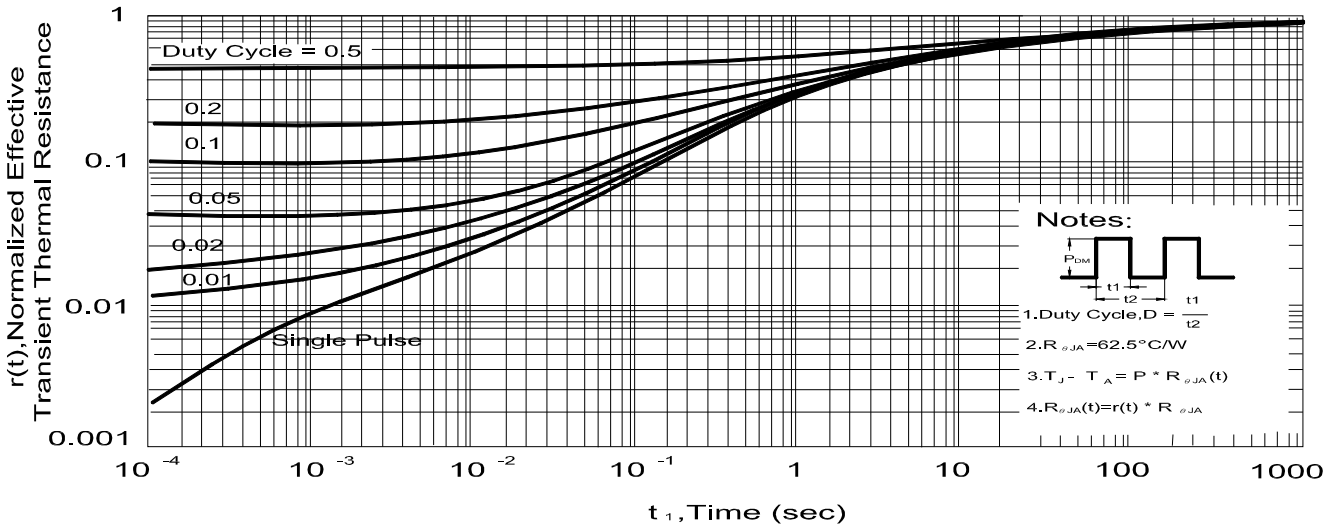
Safe Operating Area



Single Pulse Maximum Power Disspation

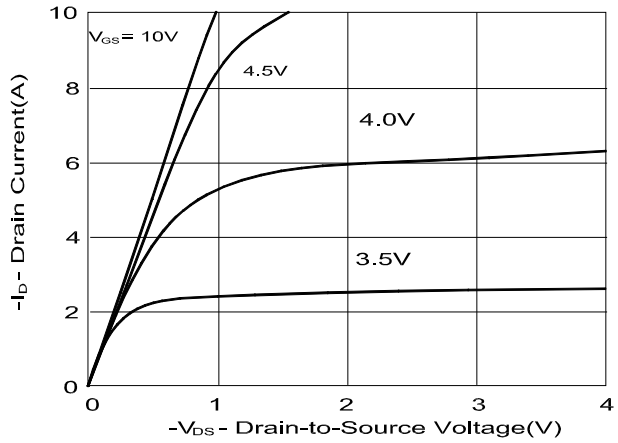


Transient Thermal Response Curve

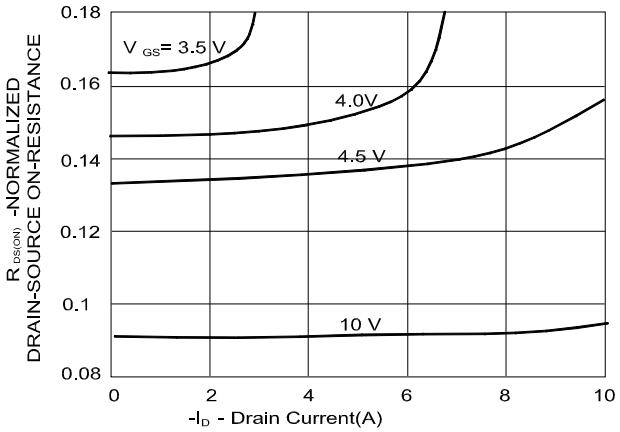


P-CHANNEL

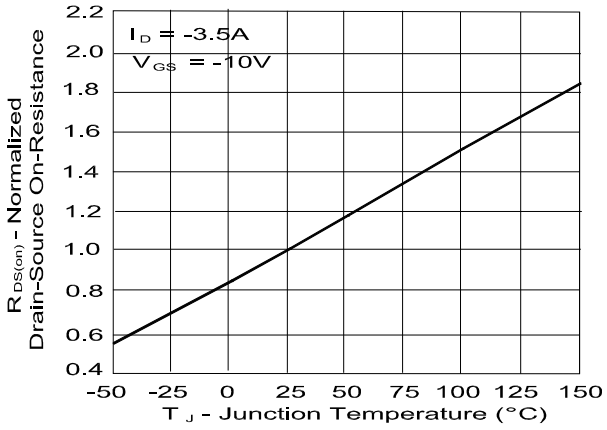
On-Region Characteristics



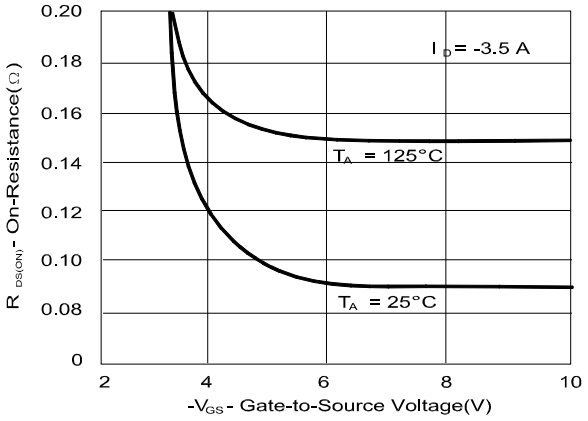
On-Resistance Variation with Drain Current and Gate Voltage



On-Resistance Variation with Temperature



On-Resistance Variation with Gate-to-Source Voltage



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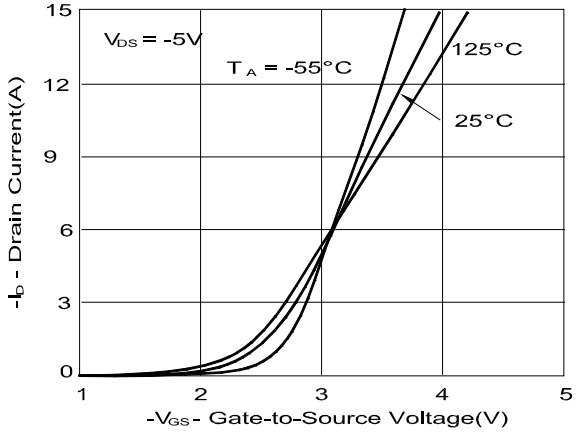

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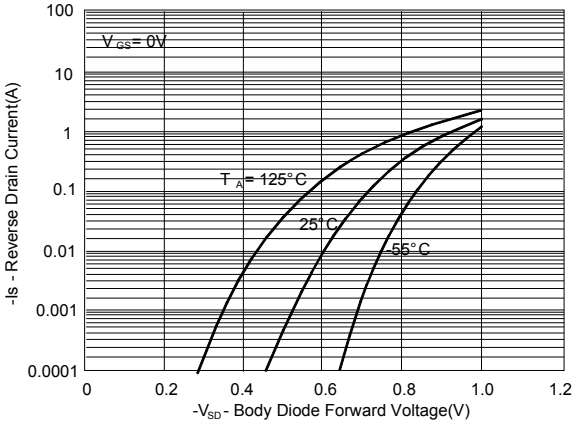
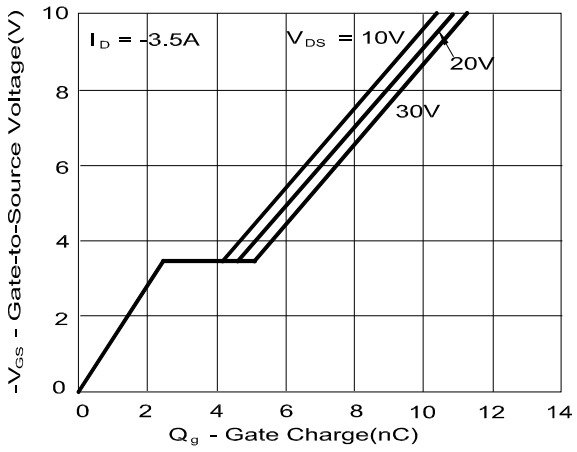


Gate Charge Characteristics



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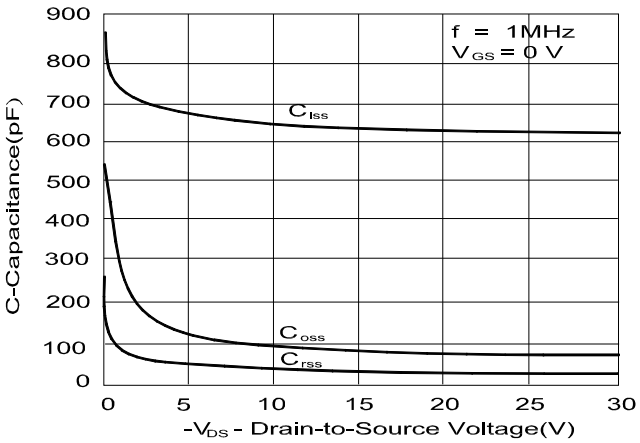

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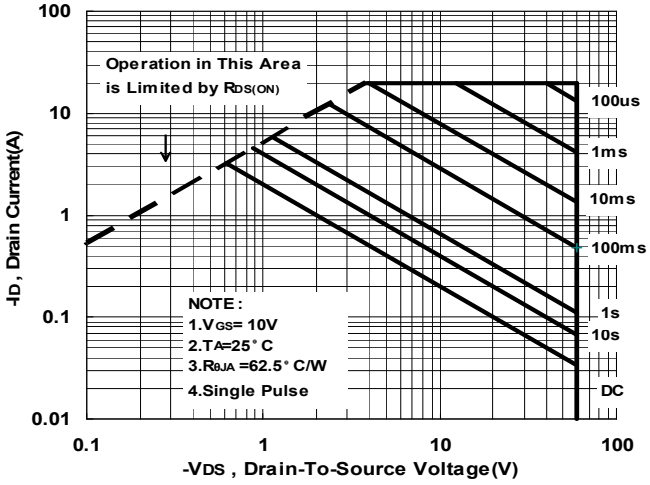

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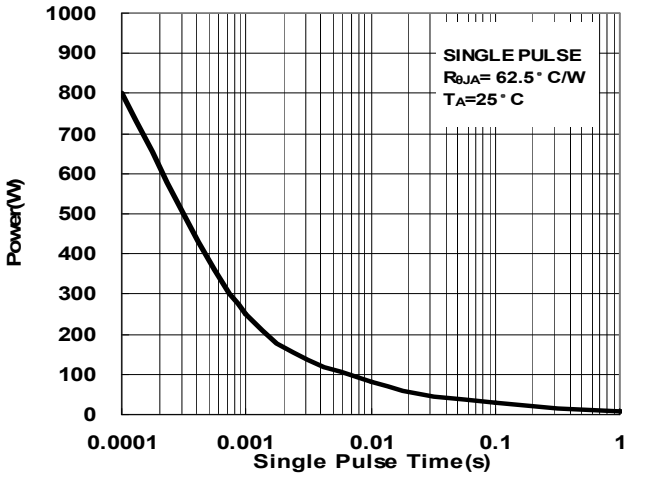

Transient Thermal Response Curve