NIKO-SEM

Dual N-Channel Enhancement Mode Field Effect Transistor

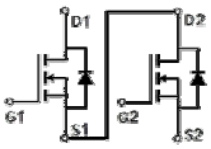
PE642DT

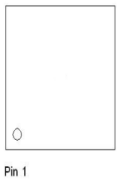
PDFN 3x3S

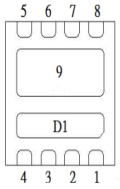
Halogen-Free & Lead-Free

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
Q2	30V	9mΩ	34A
Q1	30V	10.5mΩ	31A







1 : G1
2,3,4 : D1
5,6,7 : S2
8 : G2
9 : S1/D2

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

PARAMETERS/TEST CONDITIONS		SYMBOL	Q2	Q1	UNITS
Drain-Source Voltage		V_{DS}	30	30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current[3]	T_C = 25 °C	I_D	34	31	A
	T_C = 100 °C		22	20	
Pulsed Drain Current[1]		I_{DM}	48	46	
Continuous Drain Current[3]	T_A = 25 °C	I_D	11	9.7	
	T_A = 70 °C		8.8	7.7	
Avalanche Current		I_{AS}	21	18.3	
Avalanche Energy	L = 0.1mH	E_{AS}	22	16.7	mJ
Power Dissipation	T_C = 25 °C	P_D	20	19	W
	T_C = 100 °C		8	7.6	
Power Dissipation	T_A = 25 °C	P_D	2	1.7	W
	T_A = 70 °C		1.2	1.1	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL		TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	$R_{\theta JA}$	Q2		62	°C / W
	$R_{\theta JA}$	Q1		70	
Junction-to-Case	$R_{\theta JC}$	Q2		6.2	
	$R_{\theta JC}$	Q1		6.5	

[1]Pulse width limited by maximum junction temperature $T_{J(MAX)}$=150°C.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design.
[3]Package limitation current is Q2=14A , Q1=9.5A.

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

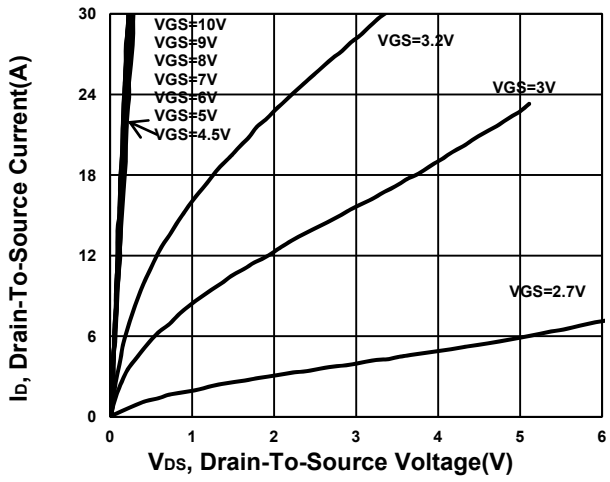
PARAMETER	SYMBOL	TEST CONDITIONS		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	Q2	30			V
			Q1	30			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	Q2	1.3	1.75	2.3	
			Q1	1.3	1.75	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	Q2			±100	nA
			Q1			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	Q2			1	μA
			Q1			1	
		V_{DS} = 20V, V_{GS} = 0V, T_J = 55 °C	Q2			10	
			Q1			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} =4.5V, I_D = 10A	Q2		8	12	mΩ
		V_{GS} =4.5V, I_D = 9A	Q1		13	15.5	
		V_{GS} = 10V, I_D = 10A	Q2		6.3	9	
		V_{GS} = 10V, I_D = 9.5A	Q1		8.6	10.5	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 10A	Q2		43		S
		V_{DS} = 5V, I_D = 9.5A	Q1		45		
DYNAMIC							
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	Q2		782		pF
			Q1		616		
Output Capacitance	C_{oss}		Q2		139		
			Q1		120		
Reverse Transfer Capacitance	C_{rss}		Q2		76		
			Q1		83		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz	Q2		2.3	3.5	Ω
			Q1		2.7	4	
Total Gate Charge[2]	Q_g VGS = 10V	Q2 V_{DS} = 15V , V_{GS} = 10V, I_D = 10A Q1 V_{DS} = 15V , V_{GS} = 10V, I_D = 9.5A	Q2		18		nC
			Q1		14		
	Q_g VGS = 4.5V		Q2		9.6		
			Q1		7.6		
Gate-Source Charge[2]	Q_{gs}		Q2		2.2		
			Q1		2.1		
Gate-Drain Charge[2]	Q_{gd}		Q2		5.2		
			Q1		4		

Turn-On Delay Time[2]	$t_{d(on)}$	Q2 V_{DS} = 15V , $I_D \cong$ 10A, V_{GS} = 10V, R_{GEN} =6Ω Q1 V_{DS} = 15V , $I_D \cong$ 9.5A, V_{GS} = 10V, R_{GEN} =6Ω	Q2		27		nS
			Q1		18		
Rise Time[2]	t_r		Q2		24		
			Q1		24		
Turn-Off Delay Time[2]	$t_{d(off)}$		Q2		47		
			Q1		44		
Fall Time[2]	t_f		Q2		25		
			Q1		23		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current[3]	I_S		Q2			16	A
			Q1			17	
Forward Voltage[1]	V_{SD}	I_F = 10A, V_{GS} = 0V	Q2			1.2	V
		I_F = 9.5A, V_{GS} = 0V	Q1			1.1	
Reverse Recovery Time	t_{rr}	Q2 I_F = 10A, dI_F/dt = 100A / μS Q1 I_F = 9.5A, dI_F/dt = 100A / μS	Q2		10.5		nS
			Q1		9.3		
Reverse Recovery Charge	Q_{rr}		Q2		2.8		nC
			Q1		2.2		

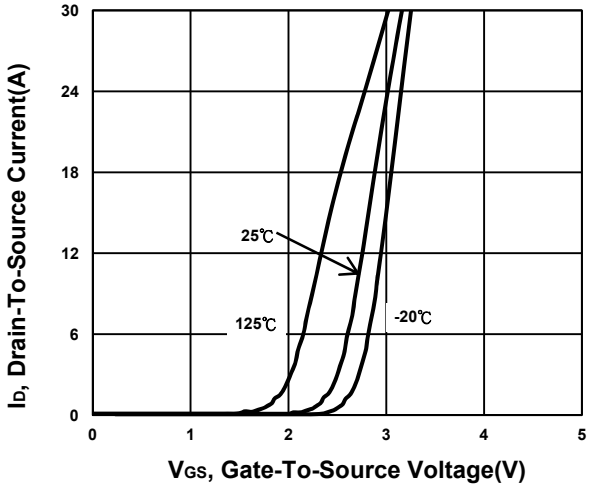
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Package limitation current is Q2=14A , Q1=9.5A.

TYPICAL PERFORMANCE CHARACTERISTICS
Q2

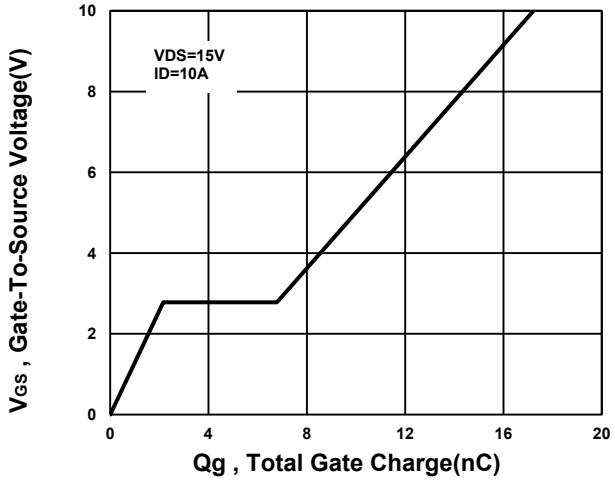
Output Characteristics



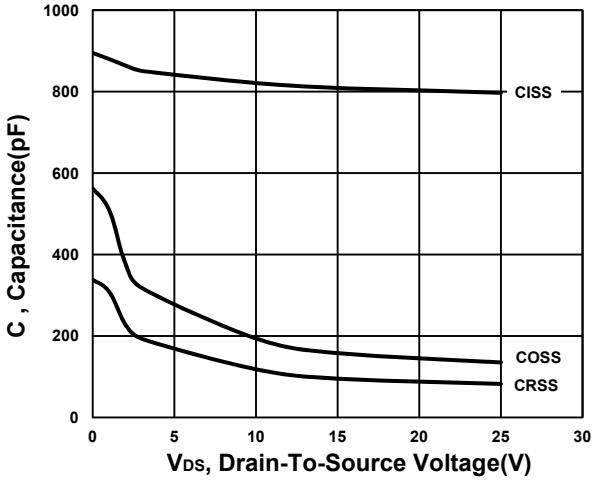
Transfer Characteristics



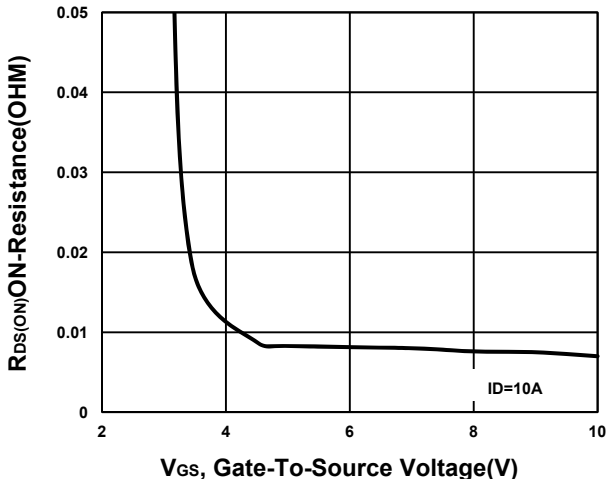
Gate charge Characteristics



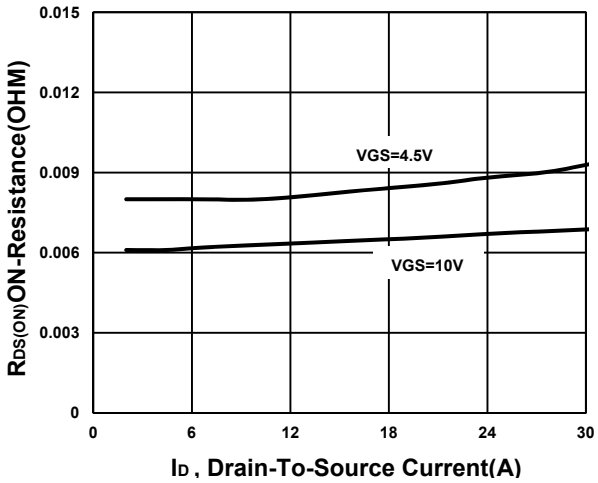
Capacitance Characteristic



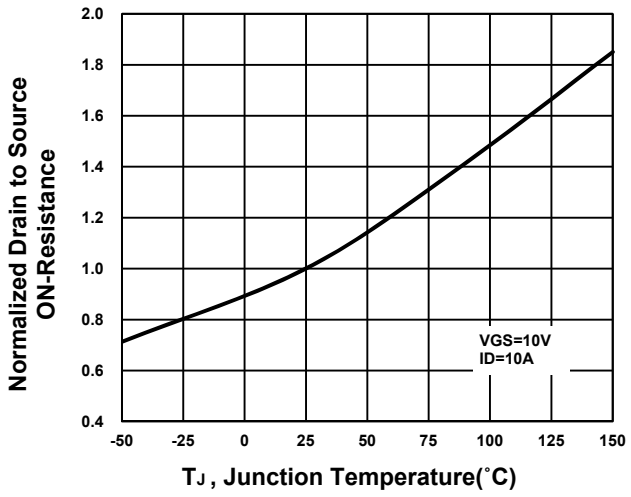
On-Resistance VS Gate-To-Source



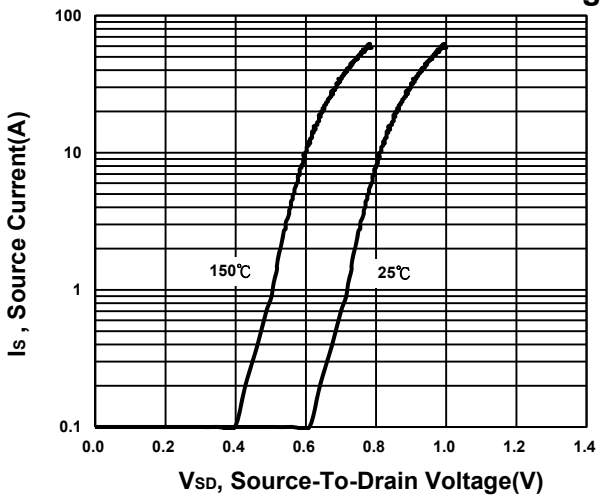
On-Resistance VS Drain Current



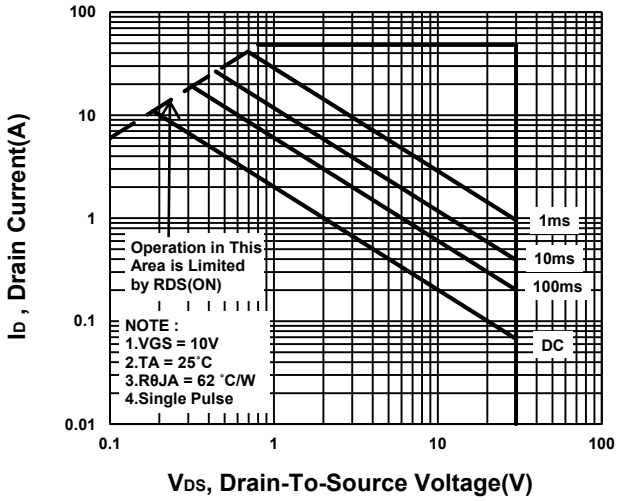
On-Resistance VS Temperature



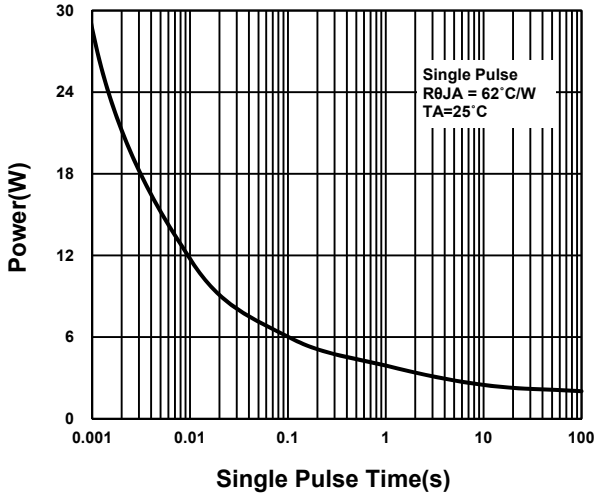
Source-Drain Diode Forward Voltage



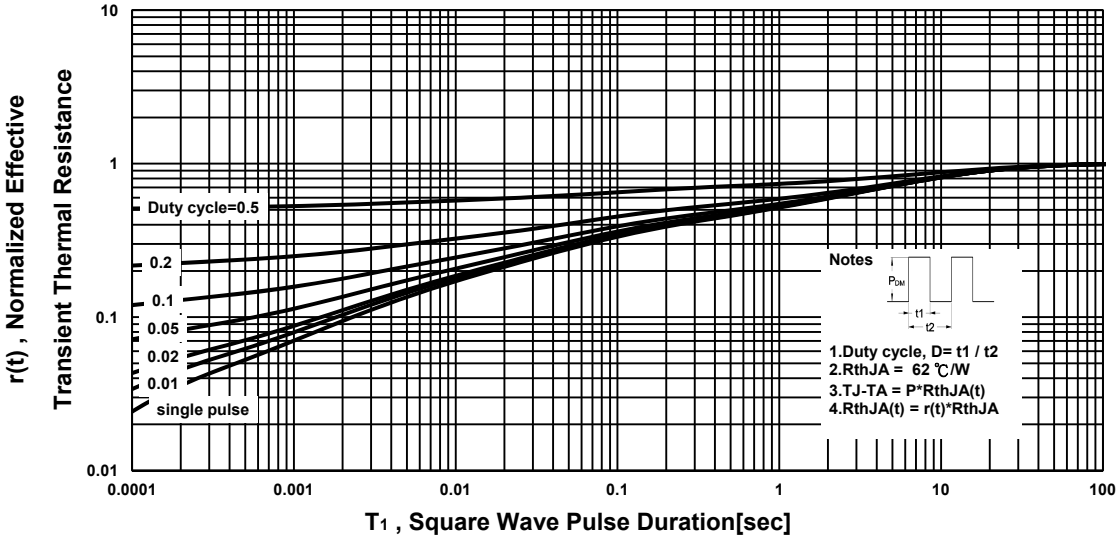
Safe Operating Area



Single Pulse Maximum Power Dissipation

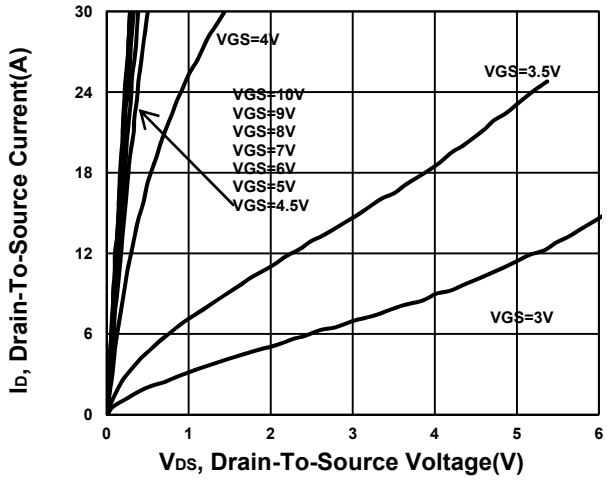


Transient Thermal Response Curve

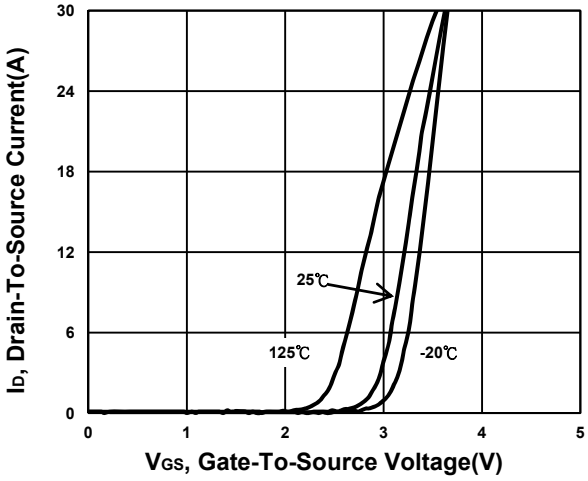


Q1

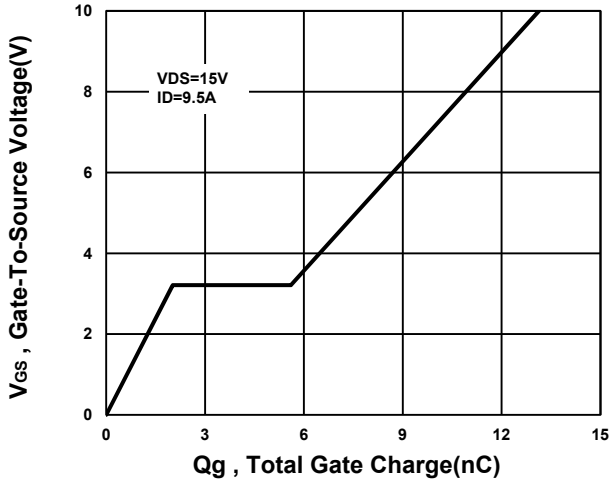
Output Characteristics



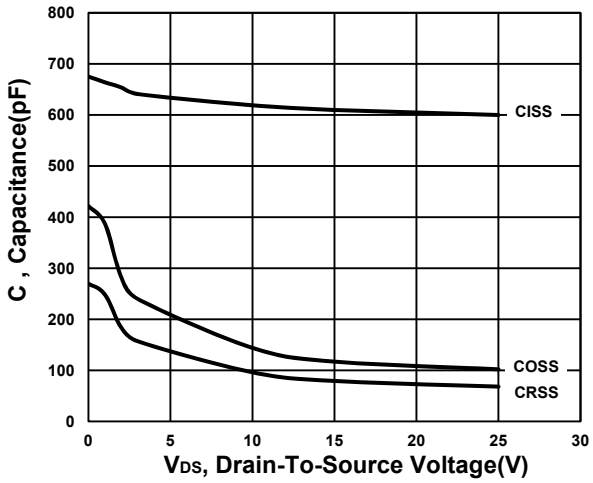
Transfer Characteristics



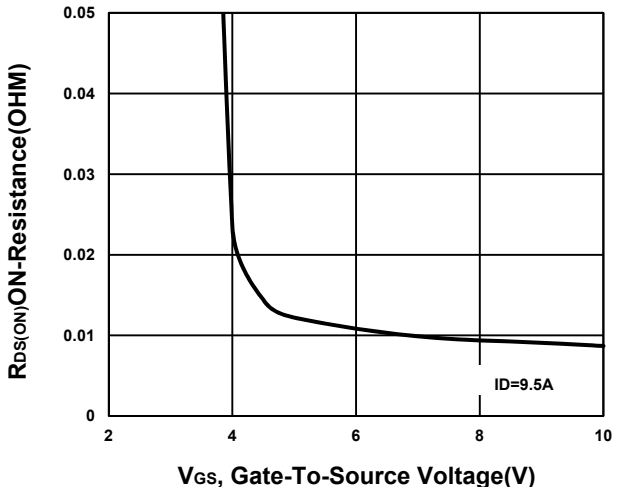
Gate charge Characteristics



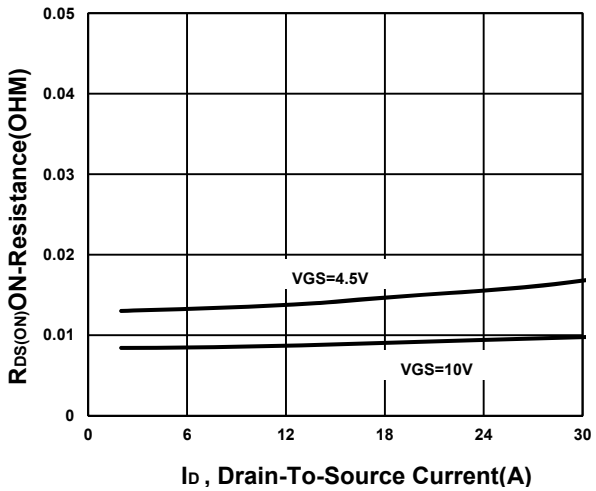
Capacitance Characteristic



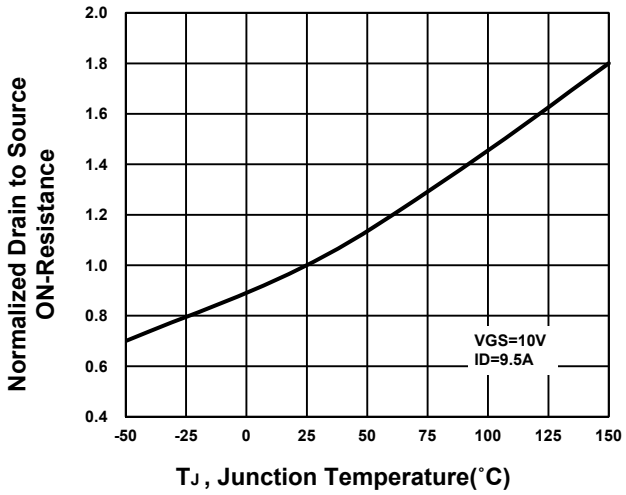
On-Resistance VS Gate-To-Source



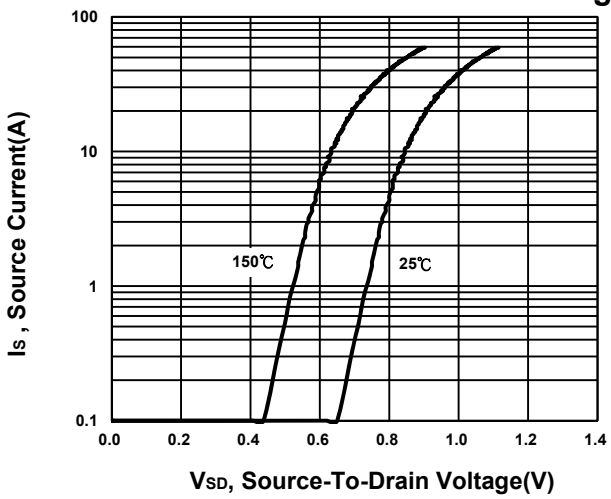
On-Resistance VS Drain Current



On-Resistance VS Temperature



Source-Drain Diode Forward Voltage



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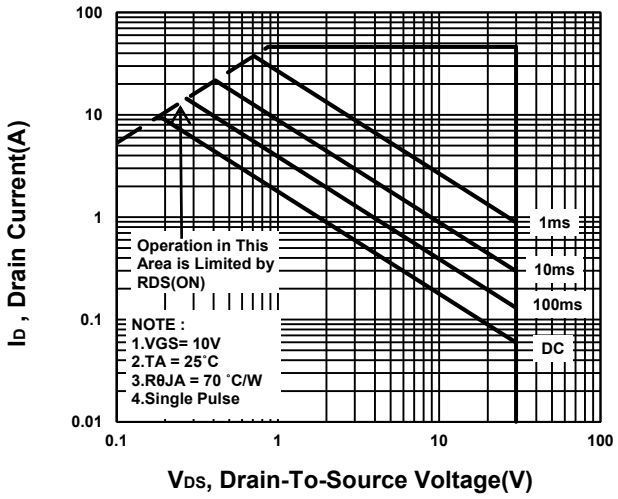

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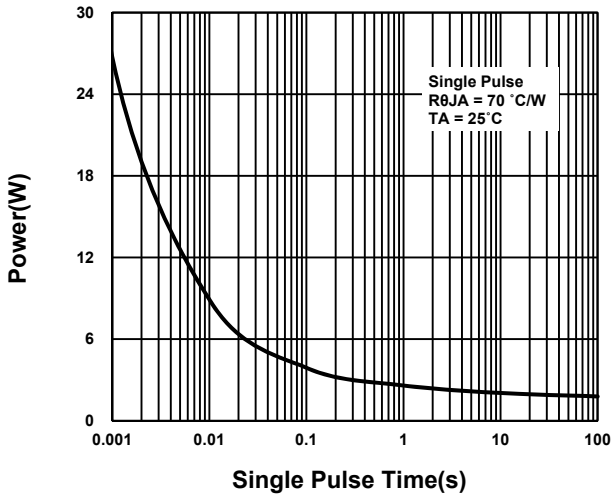

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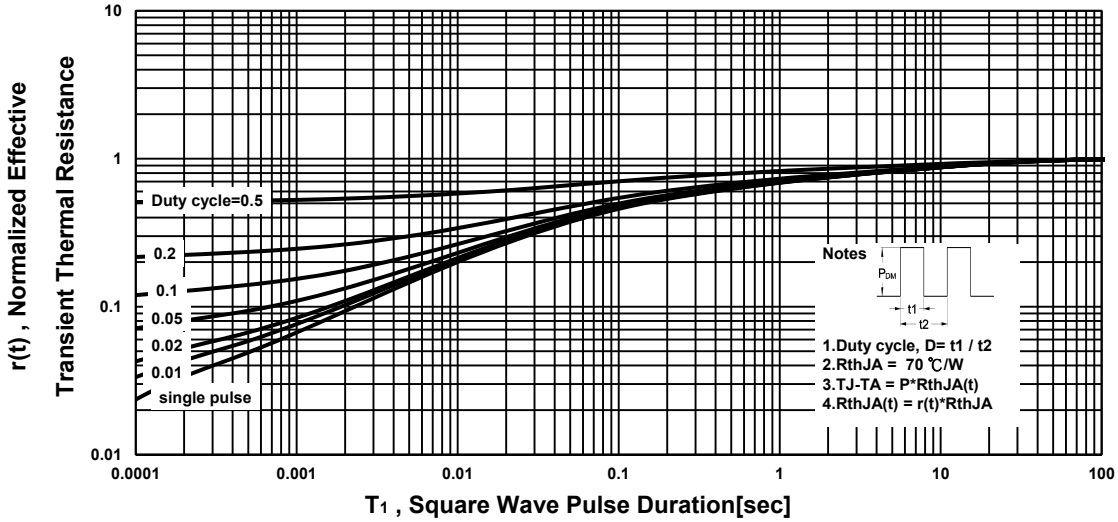

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