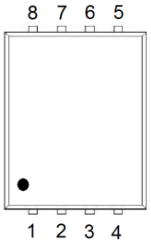
NIKO-SEM

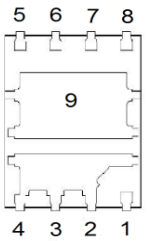
Dual N-Channel Enhancement Mode Field Effect Transistor

P0303YK
PDFN 5x6P
Halogen-Free & Lead-Free

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
Q2	30V	3.5mΩ	79A
Q1	30V	9mΩ	42A





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

RoHS Compliant

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	79	42	A
	T_C = 100 °C		50	27	
Pulsed Drain Current[1]		I_{DM}	160	120	
Continuous Drain Current	T_A = 25 °C	I_D	20	11	
	T_A = 70 °C		16	9	
Avalanche Current		I_{AS}	49	24	
Avalanche Energy	L = 0.1mH	E_{AS}	120	28	mJ
Power Dissipation	T_C = 25 °C	P_D	37	27	W
	T_C = 100 °C		15	10	
Power Dissipation	T_A = 25 °C	P_D	2.5	2	W
	T_A = 70 °C		1.6	1.2	
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		50	°C / W
	$R_{\theta JA}$	Q1		62.5	
Junction-to-Case	$R_{\theta JC}$	Q2		3.3	
	$R_{\theta JC}$	Q1		4.6	

[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 :Q1=35A,Q2=37A

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

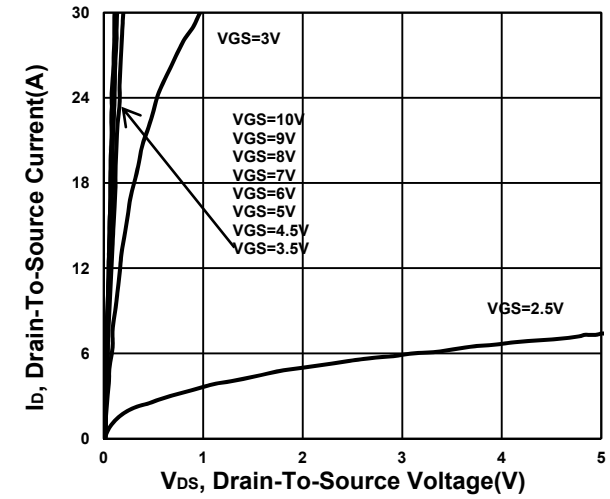
PARAMETER	SYMBOL	TEST CONDITIONS		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	Q2	30			V
			Q1	30			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	Q2	1	1.5	3	
			Q1	1	1.6	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 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 = 16A	Q2		3.7	4.5	mΩ
		V_{GS} =4.5V, I_D = 9A	Q1		9.6	14.5	
		V_{GS} = 10V, I_D = 20A	Q2		3.1	3.5	
		V_{GS} = 10V, I_D = 11A	Q1		7.3	9	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A	Q2		73		S
		V_{DS} = 5V, I_D = 11A	Q1		55		
DYNAMIC							
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	Q2		2810		pF
			Q1		850		
Output Capacitance	C_{oss}		Q2		336		
			Q1		128		
Reverse Transfer Capacitance	C_{rss}		Q2		321		
			Q1		115		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz	Q2		0.9		Ω
			Q1		2.1		
Total Gate Charge[2]	Q_g VGS = 10V	Q2 V_{DS} = 15V , V_{GS} = 10V, I_D = 20A Q1 V_{DS} = 15V , V_{GS} = 10V, I_D = 11A	Q2		63.3		nC
			Q1		23		
	Q_g VGS = 4.5V		Q2		35		
			Q1		12.3		
Gate-Source Charge[2]	Q_{gs}		Q2		10		
			Q1		3.1		
Gate-Drain Charge[2]	Q_{gd}		Q2		15		
			Q1		7		

Turn-On Delay Time[2]	$t_{d(on)}$	Q2 V_{DS} = 15V , $I_D \cong$ 20A, V_{GS} = 10V, R_{GEN} =6Ω Q1 V_{DS} = 15V , $I_D \cong$ 11A, V_{GS} = 10V, R_{GEN} =6Ω	Q2		27		nS
			Q1		18		
Rise Time[2]	t_r		Q2		14		
			Q1		10		
Turn-Off Delay Time[2]	$t_{d(off)}$		Q2		59		
			Q1		36		
Fall Time[2]	t_f		Q2		20		
			Q1		15		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current[3]	I_S		Q2			79	A
			Q1			42	
Forward Voltage[1]	V_{SD}	I_F =20A, V_{GS} = 0V	Q2			1	V
		I_F = 11A, V_{GS} = 0V	Q1			1.2	
Reverse Recovery Time	t_{rr}	Q2 I_F = 20A, dI_F/dt = 100A / μS Q1 I_F = 11A, dI_F/dt = 100A / μS	Q2		28		nS
			Q1		17		
Reverse Recovery Charge	Q_{rr}		Q2		15		nC
			Q1		5		

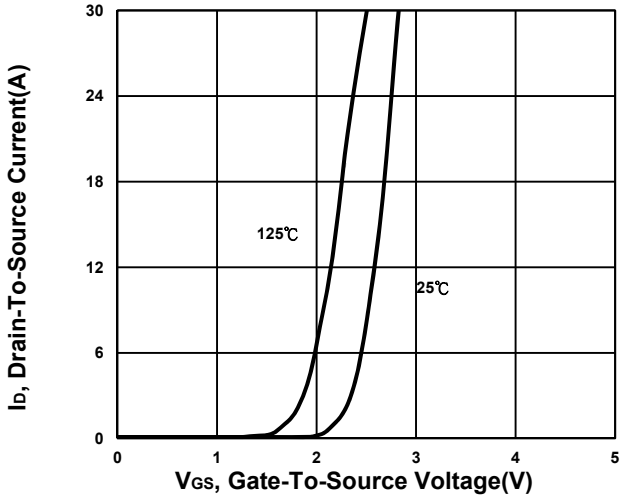
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Package limitation current :Q1=35A,Q2=37A

TYPICAL PERFORMANCE CHARACTERISTICS
Q2

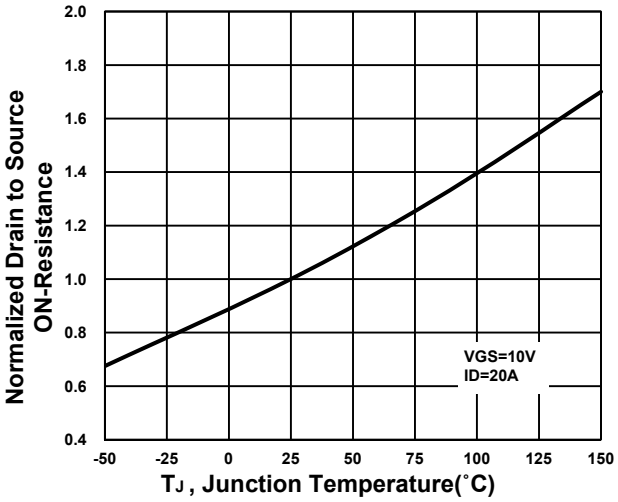
Output Characteristics



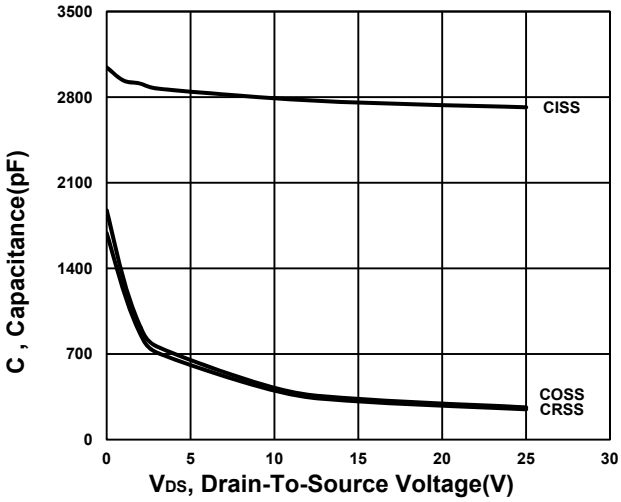
Transfer Characteristics



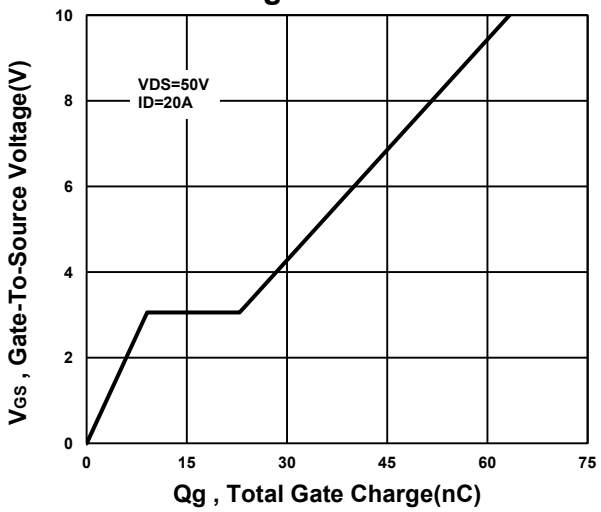
On-Resistance VS Temperature



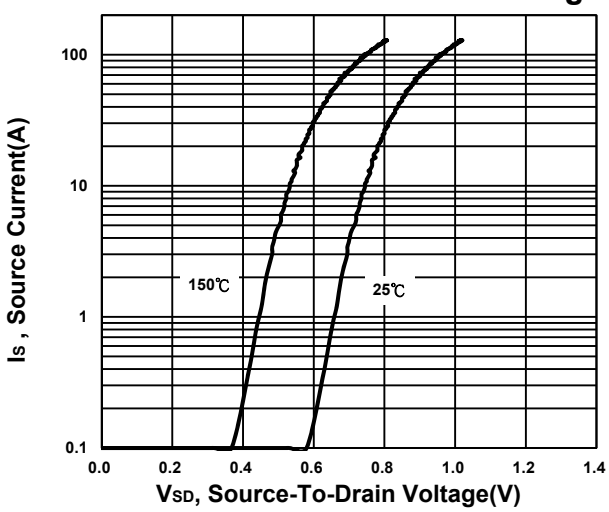
Capacitance Characteristic



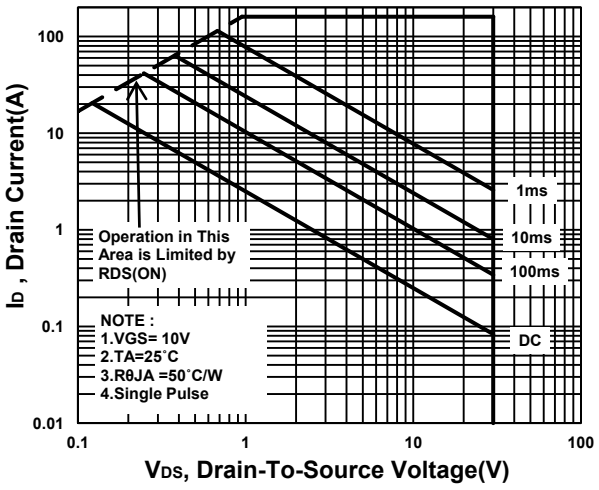
Gate charge Characteristics



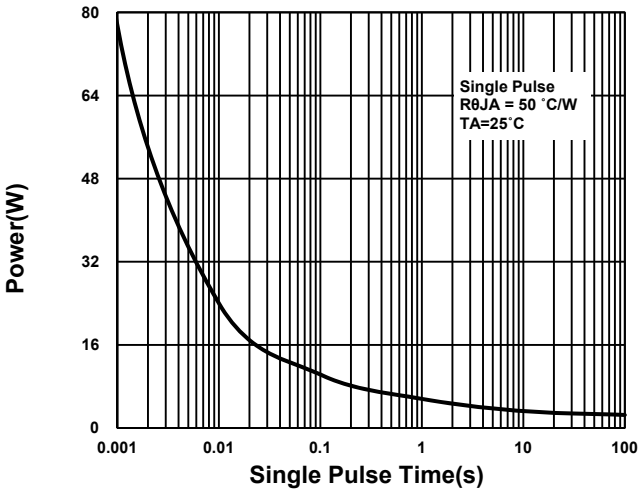
Source-Drain Diode Forward Voltage



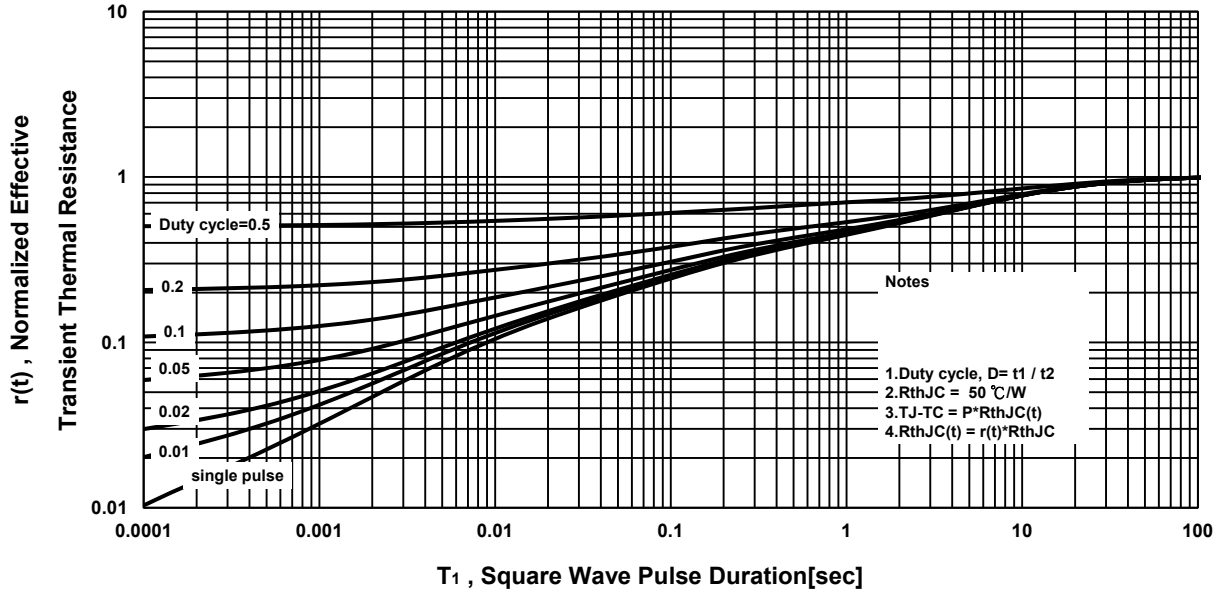
Safe Operating Area



Single Pulse Maximum Power Dissipation

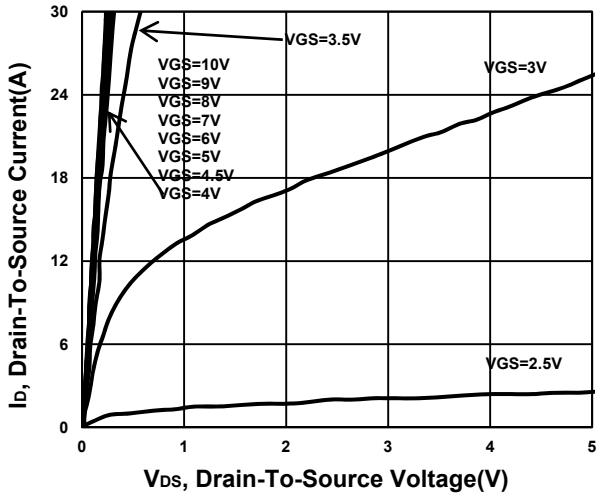


Transient Thermal Response Curve

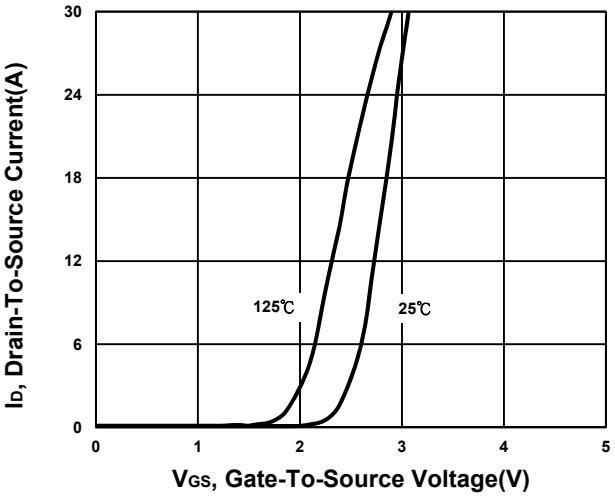


TYPICAL PERFORMANCE CHARACTERISTICS
Q1

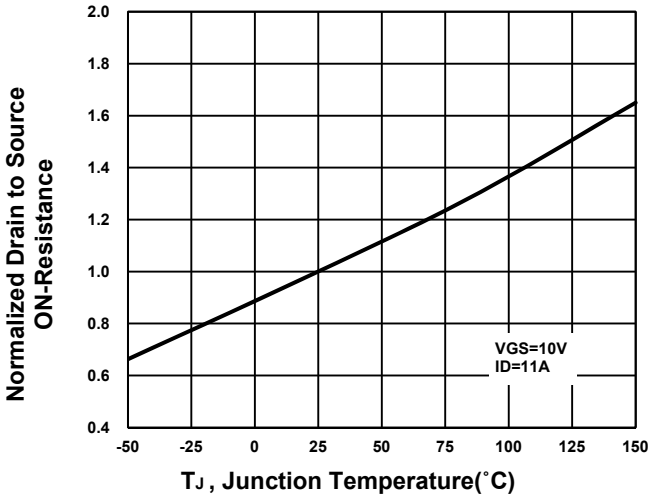
Output Characteristics



Transfer Characteristics



On-Resistance VS Temperature



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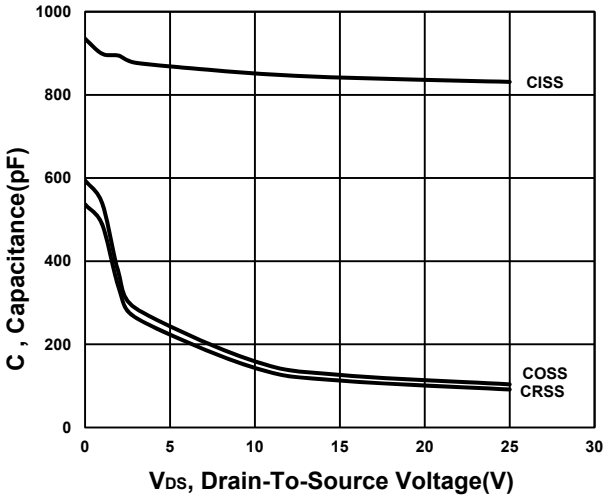
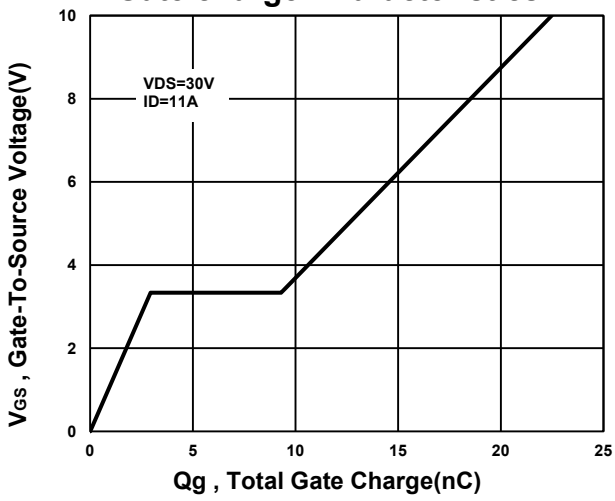


Gate charge Characteristics



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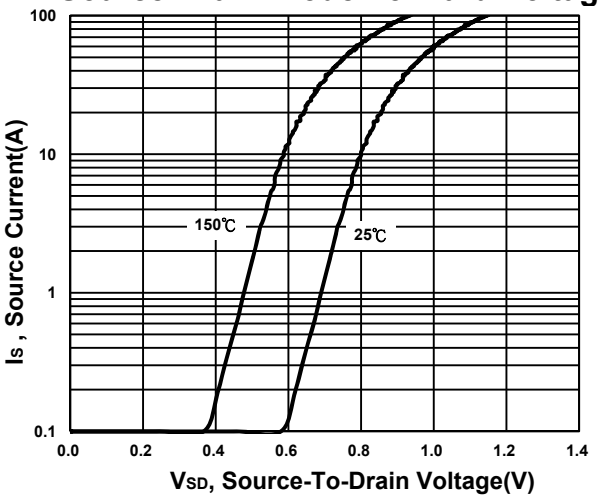

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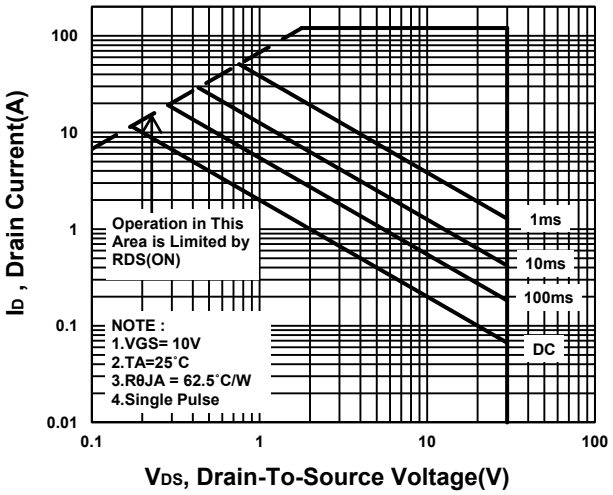

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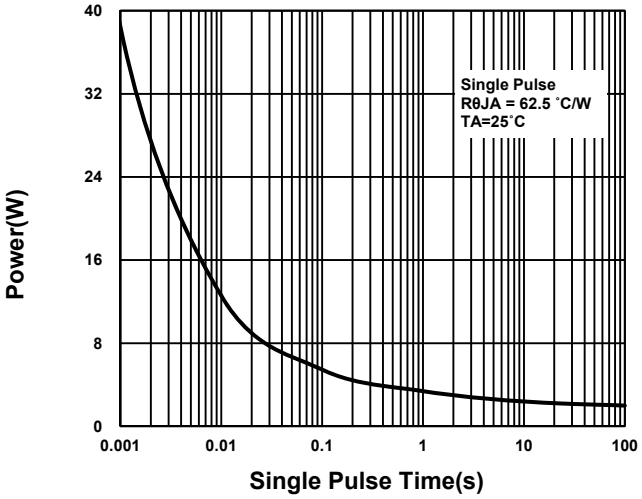

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