NIKO-SEM

N- & P-Channel Enhancement Mode Field Effect Transistor

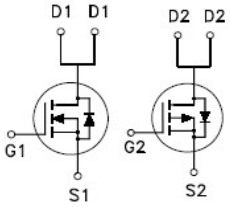
P5506NK

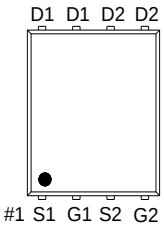
PDFN 5x6P

Halogen-Free & Lead-Free

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
Q2	-60V	95mΩ	-13A
Q1	60V	55mΩ	15A





G. GATE
D. DRAIN
S. SOURCE

RoHS Compliant

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

PARAMETERS/TEST CONDITIONS		SYMBOL	Q2	Q1	UNITS
Drain-Source Voltage		V_{DS}	-60	60	V
Gate-Source Voltage		V_{GS}	±25	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	-13	15	A
	T_C = 100 °C		-8.2	9.9	
Pulsed Drain Current[1]		I_{DM}	-30	30	
Continuous Drain Current[3]	T_A = 25 °C	I_D	-3.5	4.2	
	T_A = 70 °C		-2.8	3.4	
Avalanche Current		I_{AS}	-16.7	14	
Avalanche Energy	L = 0.1mH	E_{AS}	13.9	9.8	mJ
Power Dissipation	T_C = 25 °C	P_D	31	31	W
	T_C = 100 °C		12.5	12.5	
Power Dissipation[3]	T_A = 25 °C	P_D	2.2	2.2	W
	T_A = 70 °C		1.4	1.4	
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]	t ≦10s	$R_{\theta JA}$	Q2		55	°C / W
			Q1		55	
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$	Q2		80	
			Q1		80	
Junction-to-Case		$R_{\theta JC}$	Q2		4	
			Q1		4	

[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]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

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

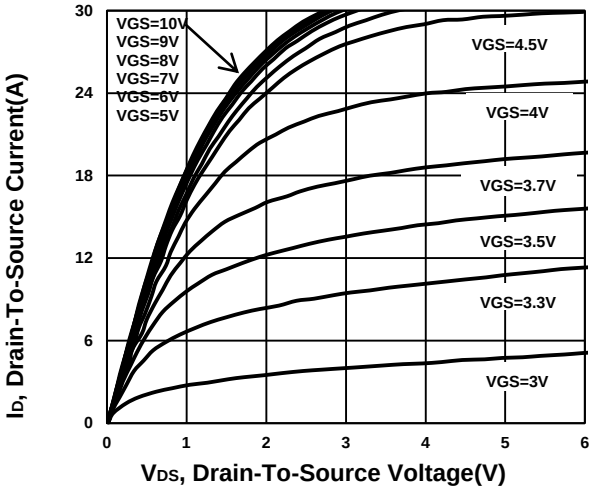
PARAMETER	SYMBOL	TEST CONDITIONS		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	Q2	-60			V
		V_{GS} = 0V, I_D = 250μA	Q1	60			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	Q2	-1.3	-1.8	-2.3	
		V_{DS} = V_{GS}, I_D = 250μA	Q1	1.3	1.8	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±25V	Q2			±100	nA
		V_{DS} = 0V, V_{GS} = ±20V	Q1			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -48V, V_{GS} = 0V	Q2			-1	μA
		V_{DS} = 48V, V_{GS} = 0V	Q1			1	
		V_{DS} = -40V, V_{GS} = 0V, T_J = 55 °C	Q2			-10	
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C	Q1			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -6A	Q2		113	135	mΩ
		V_{GS} = 4.5V, I_D = 8A	Q1		54	72	
		V_{GS} = -10V, I_D = -7A	Q2		81	95	
		V_{GS} = 10V, I_D = 10A	Q1		45	55	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -7A	Q2		12		S
		V_{DS} = 5V, I_D = 10A	Q1		21		
DYNAMIC							
Input Capacitance	C_{iss}	Q2 V_{GS} = 0V, V_{DS} = -25V f = 1MHz Q1 V_{GS} = 0V, V_{DS} = 25V f = 1MHz	Q2		538		pF
			Q1		382		
Output Capacitance	C_{oss}		Q2		77		
			Q1		54		
Reverse Transfer Capacitance	C_{rss}		Q2		49		
			Q1		36		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz	Q2		9		Ω
			Q1		1.6		
Total Gate Charge[2]	Q_g VGS = 10V	Q2 V_{DS} = -30V V_{GS} = -10V, I_D = -7A Q1 V_{DS} = 30V V_{GS} = 10V, I_D = 10A	Q2		12		nC
			Q1		10		
	Q_g VGS = 4.5V		Q2		6.7		
			Q1		6		
Gate-Source Charge[2]	Q_{gs}		Q2		1.6		
			Q1		1.2		
Gate-Drain Charge[2]	Q_{gd}		Q2		3.8		
			Q1		3.9		

Turn-On Delay Time[2]	$t_{d(on)}$	Q2 , V_{DS} = -30V $I_D \cong$ -7A V_{GS} = -10V, R_{GEN} =6Ω Q1 , V_{DS} = 30V $I_D \cong$ 10A, V_{GS} = 10V, R_{GEN} =6Ω	Q2		11		nS
			Q1		10		
Rise Time[2]	t_r		Q2		31		
			Q1		48		
Turn-Off Delay Time[2]	$t_{d(off)}$		Q2		50		
			Q1		21		
Fall Time[2]	t_f		Q2		57		
			Q1		83		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current	I_S		Q2			-13	A
			Q1			15	
Forward Voltage[1]	V_{SD}	I_F = -7A V_{GS} = 0V	Q2			-1	V
		I_F = 10A, V_{GS} = 0V	Q1			1.2	
Reverse Recovery Time	t_{rr}	Q2 I_F = -7A dI_F/dt = 100A / μS	Q2		17		nS
			Q1		15		
Reverse Recovery Charge	Q_{rr}	Q1 I_F = 10A, dI_F/dt = 100A / μS	Q2		14		nC
			Q1		10		

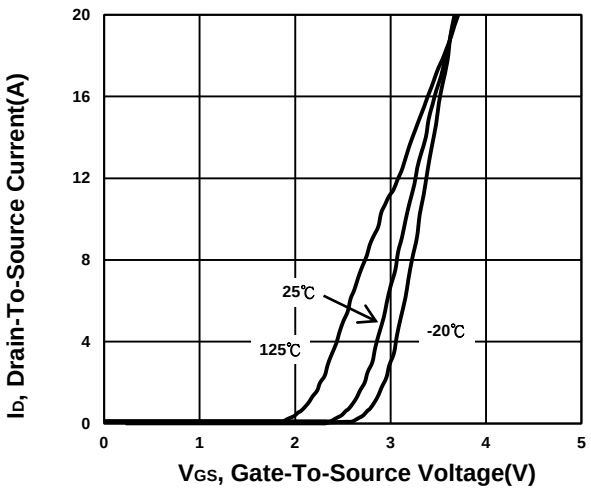
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

TYPICAL PERFORMANCE CHARACTERISTICS
N-CHANNEL

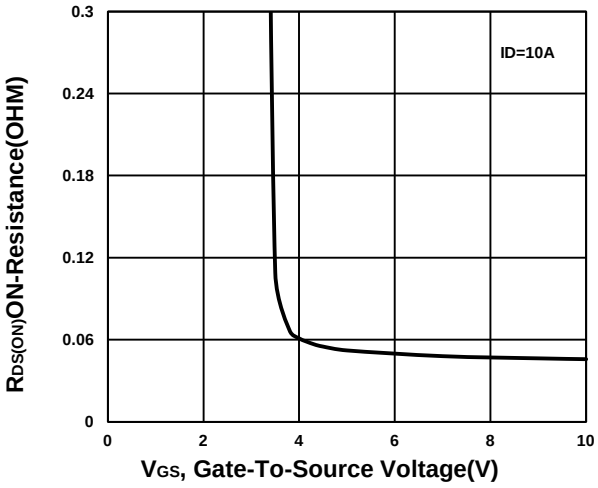
Output Characteristics



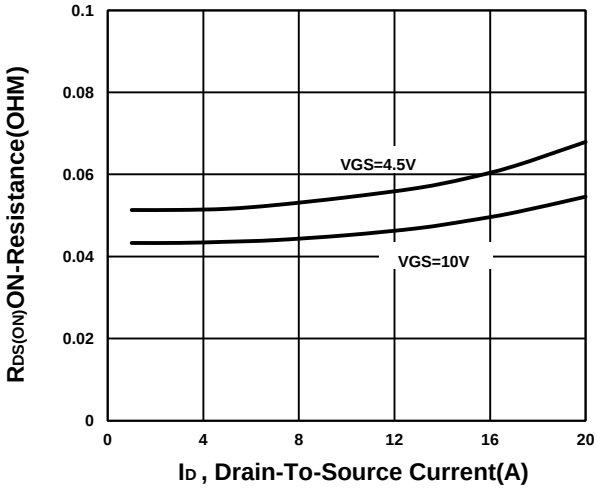
Transfer Characteristics



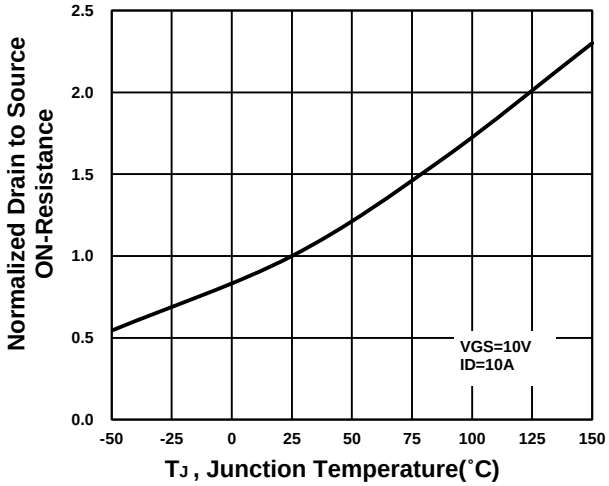
On-Resistance VS Gate-To-Source Voltage



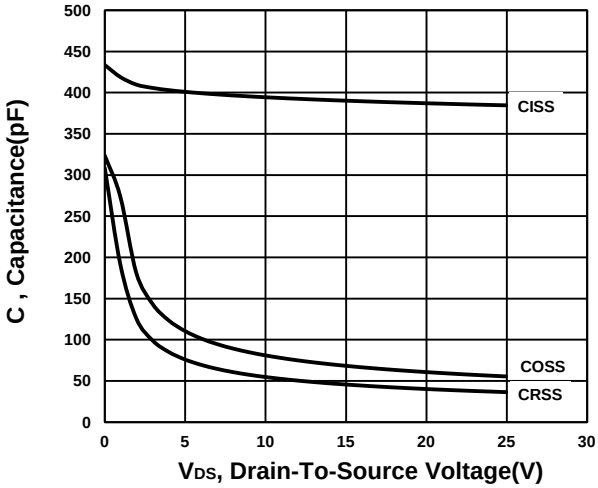
On-Resistance VS Drain Current



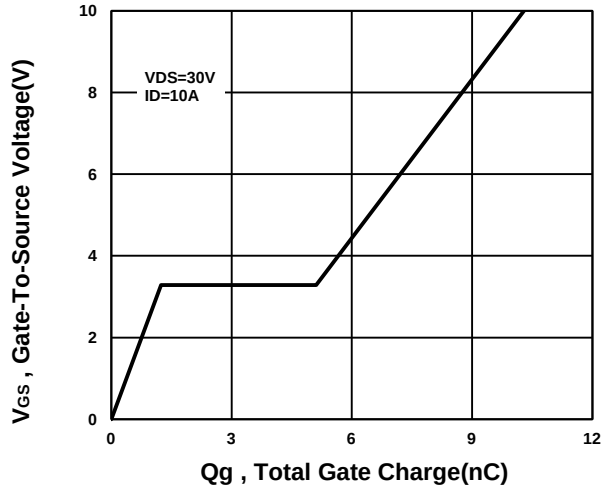
On-Resistance VS Temperature



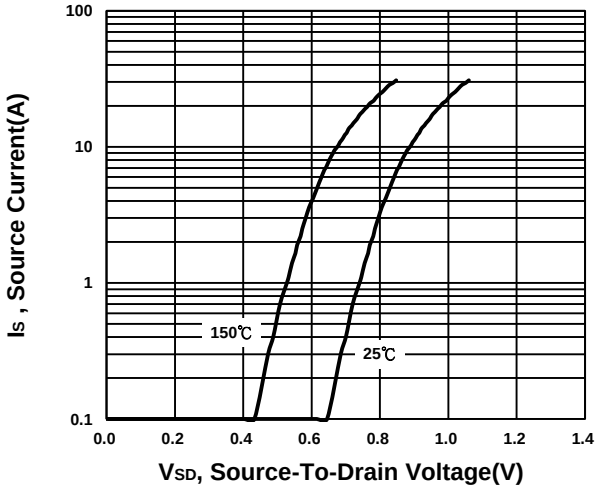
Capacitance Characteristic



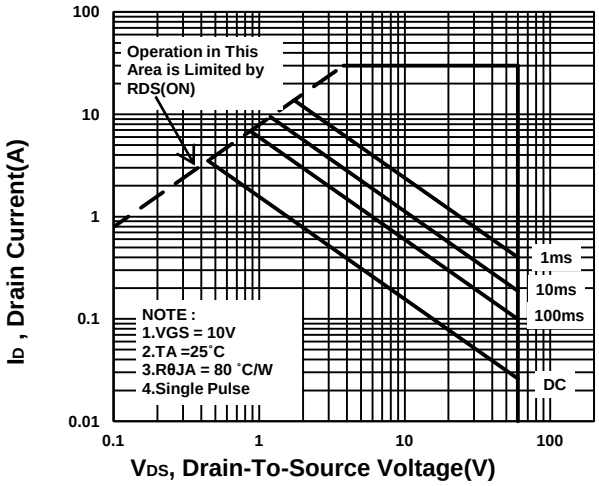
Gate charge Characteristics



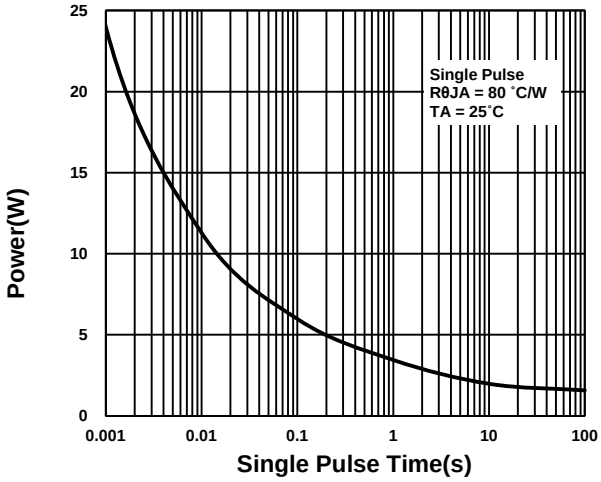
Source-Drain Diode Forward Voltage



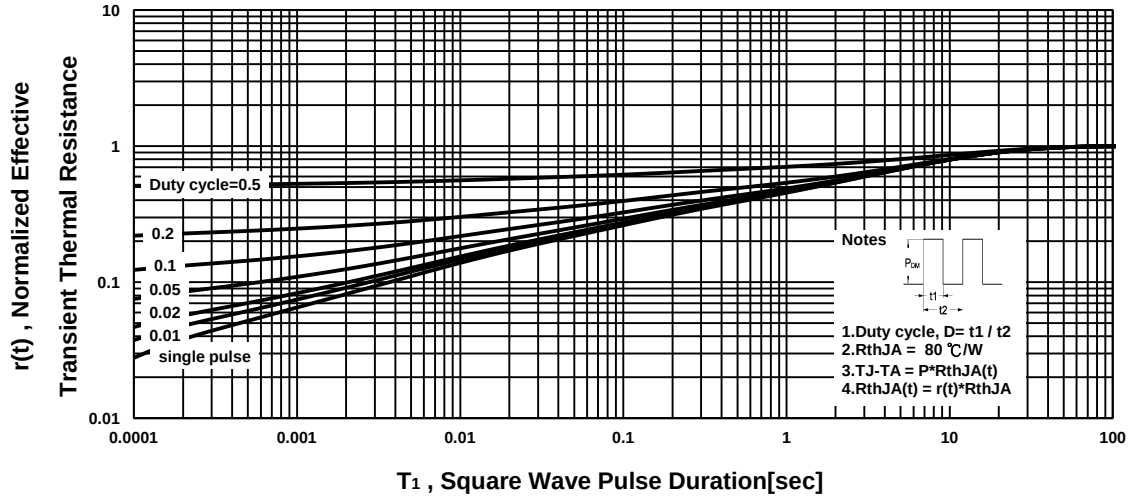
Safe Operating Area



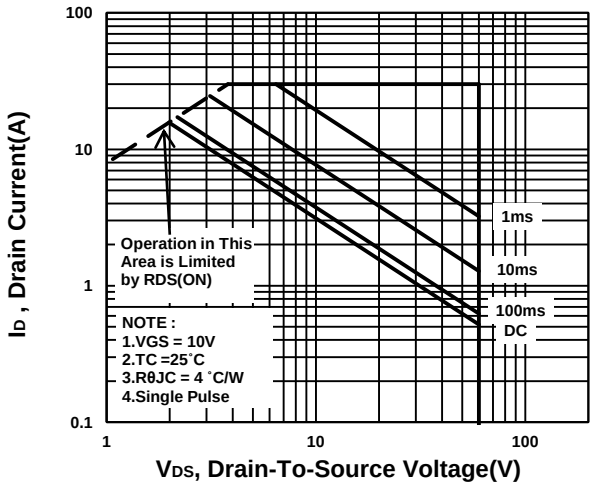
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



Safe Operating Area



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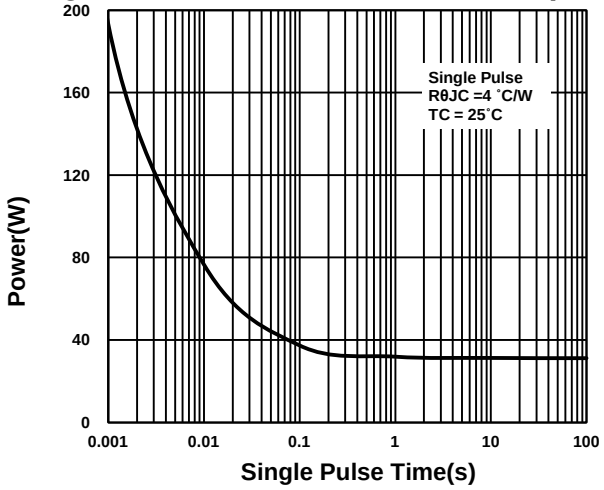
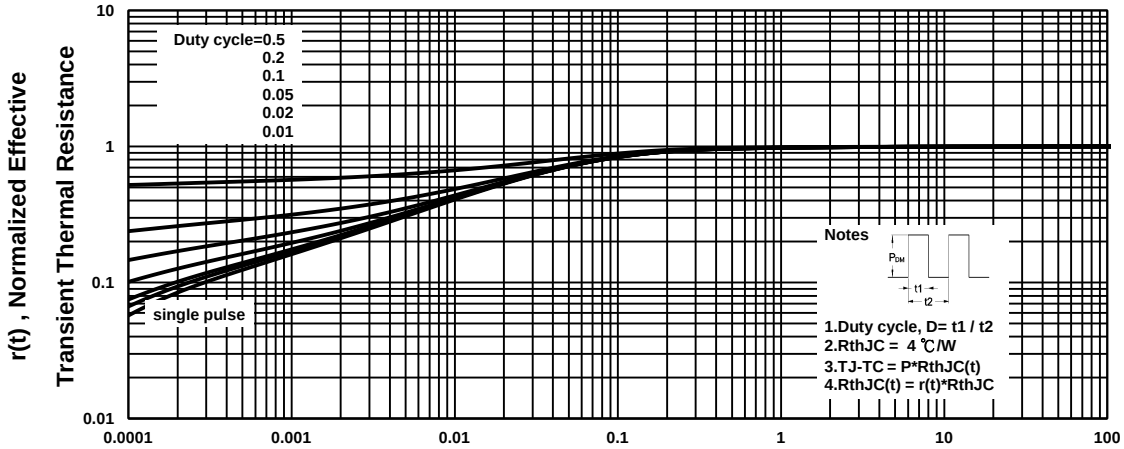
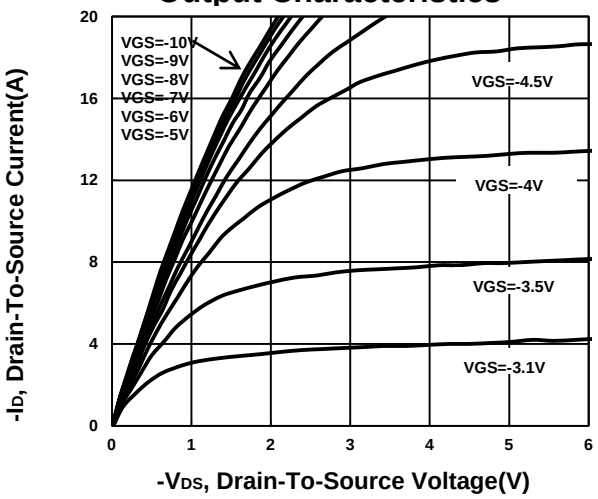


Transient Thermal Response Curve

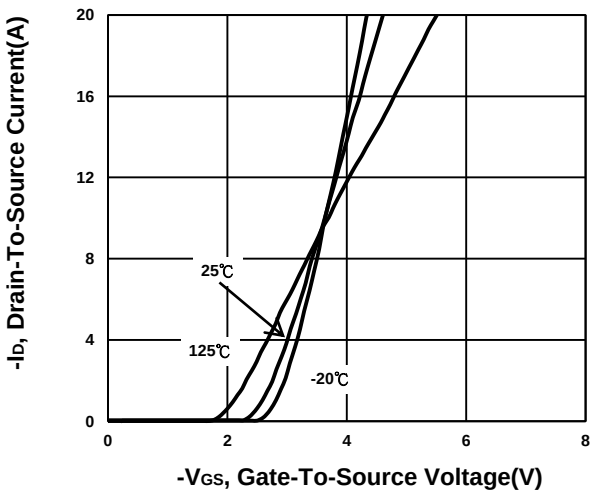


P-CHANNEL

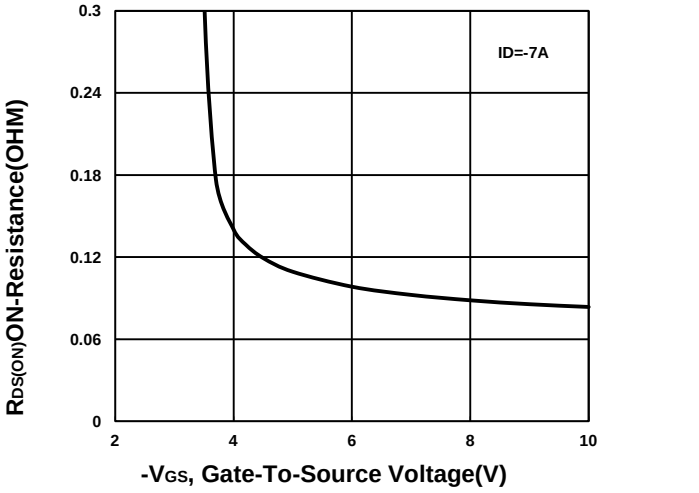
Output Characteristics



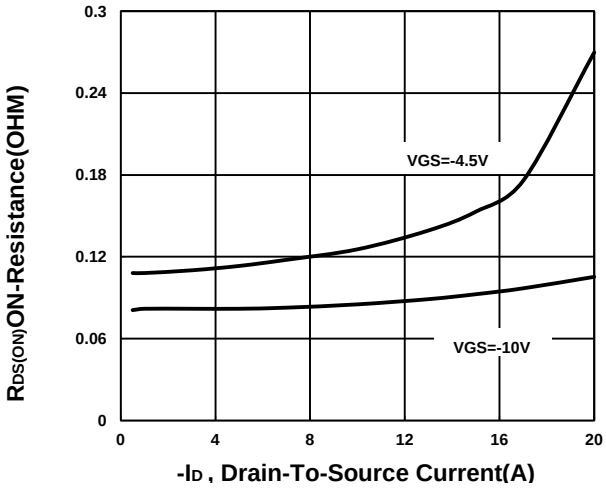
Transfer Characteristics



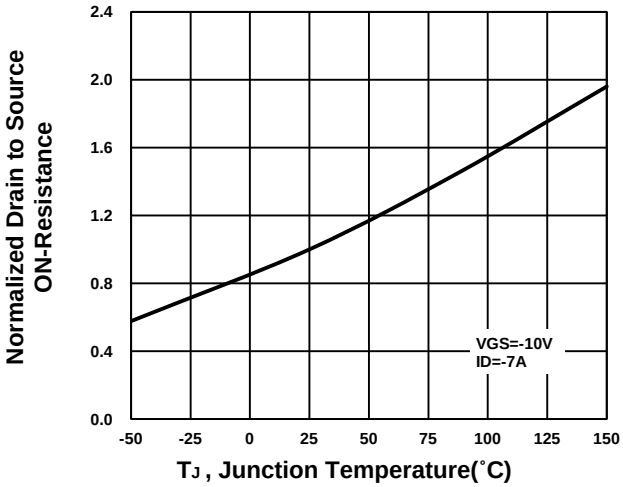
On-Resistance VS Gate-To-Source Voltage



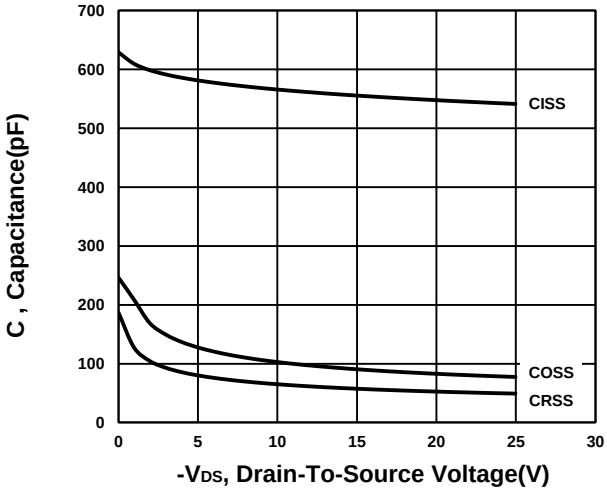
On-Resistance VS Drain Current



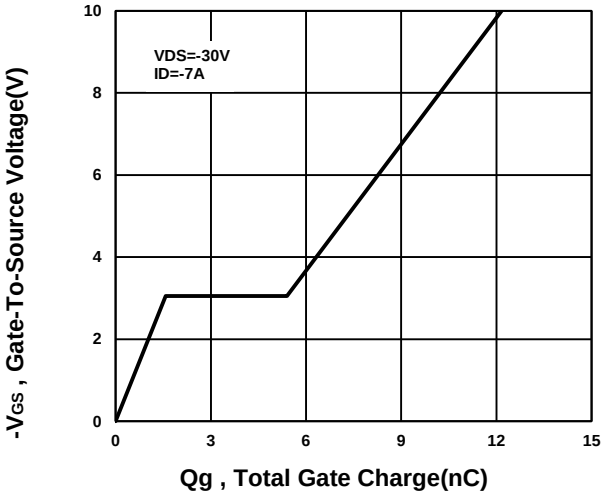
On-Resistance VS Temperature



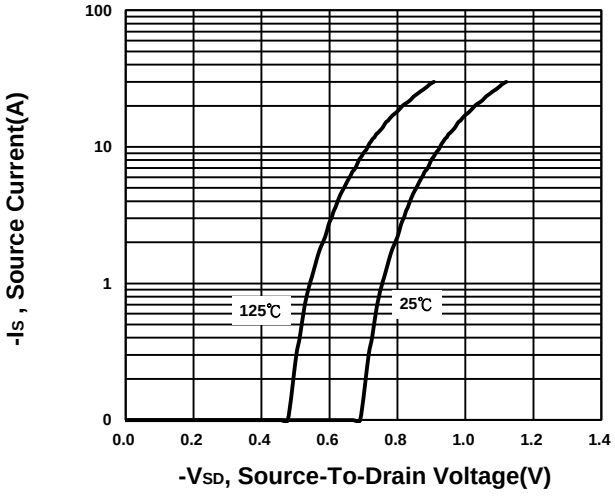
Capacitance Characteristic



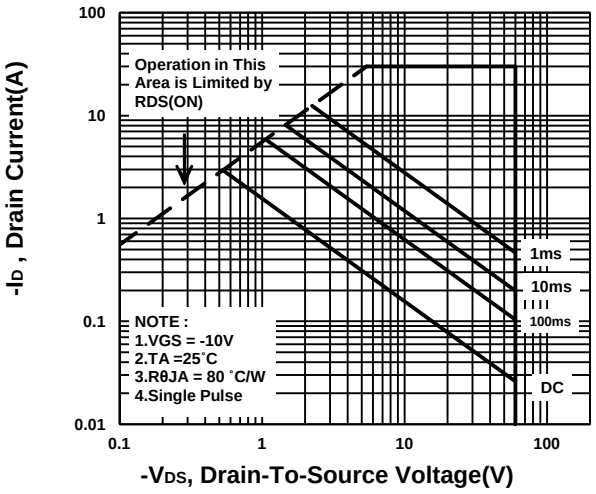
Gate charge Characteristics



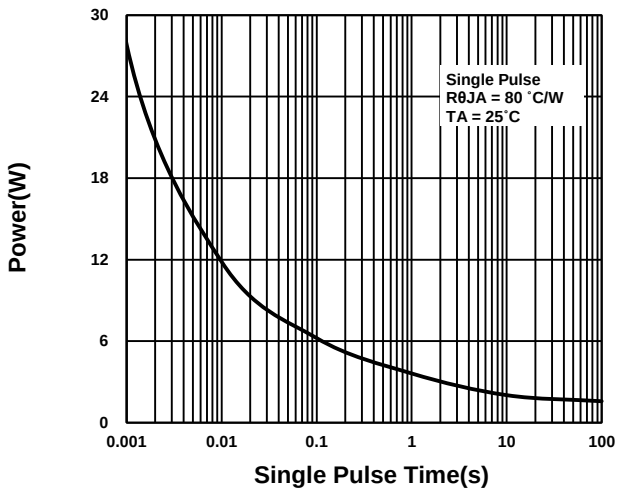
Source-Drain Diode Forward Voltage



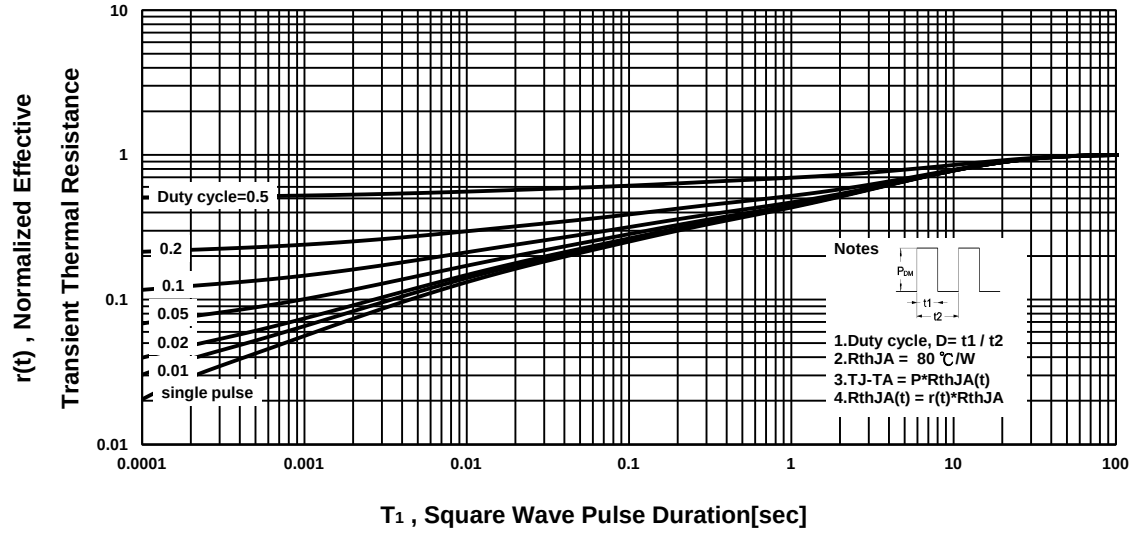
Safe Operating Area



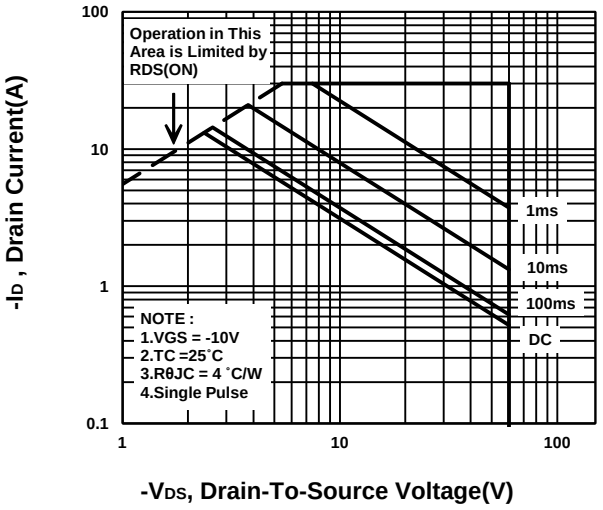
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

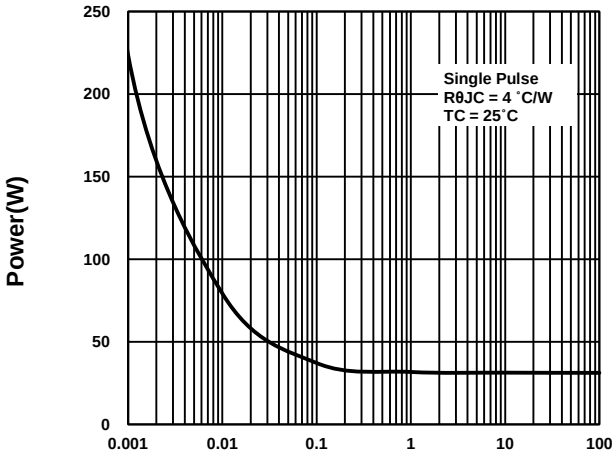


Safe Operating Area



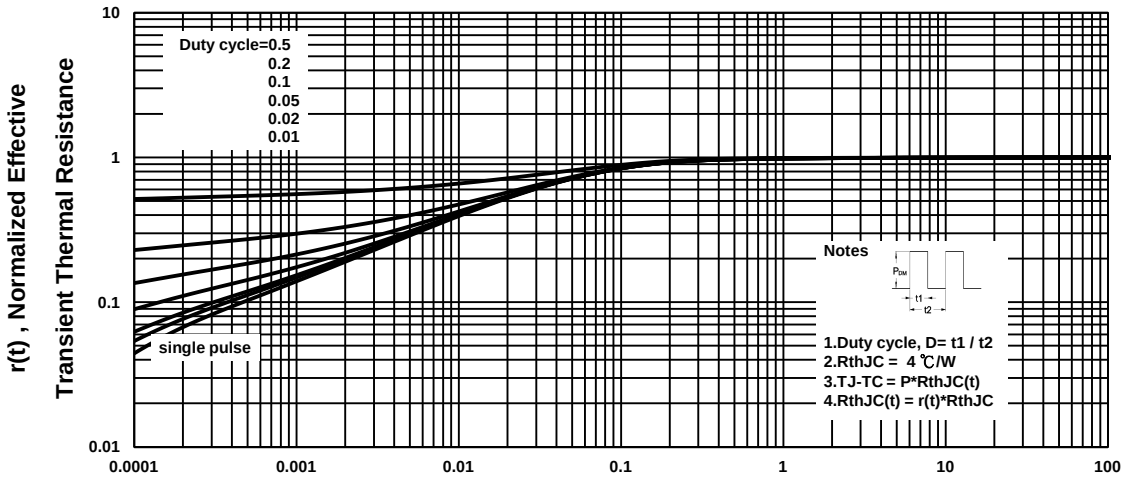
-VDS, Drain-To-Source Voltage(V)

Single Pulse Maximum Power Dissipation



Single Pulse Time(s)

Transient Thermal Response Curve



T1 , Square Wave Pulse Duration[sec]