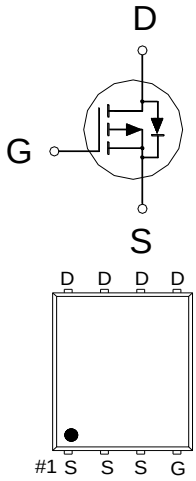
NIKO-SEM

P-Channel Enhancement Mode Field Effect Transistor

P5510EK
PDFN 5x6P
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-100V	59mΩ	-27A



1. GATE
2. DRAIN
3. SOURCE

Features
- Pb−Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.

Applications
- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current	T_C = 25 °C	I_D	-27	A
	T_C = 100 °C		-17	
Pulsed Drain Current[1]		I_{DM}	-55	
Continuous Drain Current	T_A = 25 °C	I_D	-4.7	
	T_A = 70 °C		-3.8	
Avalanche Current		I_{AS}	-18	
Avalanche Energy	L = 1mH	E_{AS}	162	mJ
Power Dissipation	T_C = 25 °C	P_D	89	W
	T_C = 100 °C		36	
Power Dissipation[3]	T_A = 25 °C	P_D	2.8	W
	T_A = 70 °C		1.8	
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	$R_{\theta JA}$		45	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		65	
Junction-to-Case	Steady-State	$R_{\theta JC}$		1.4	

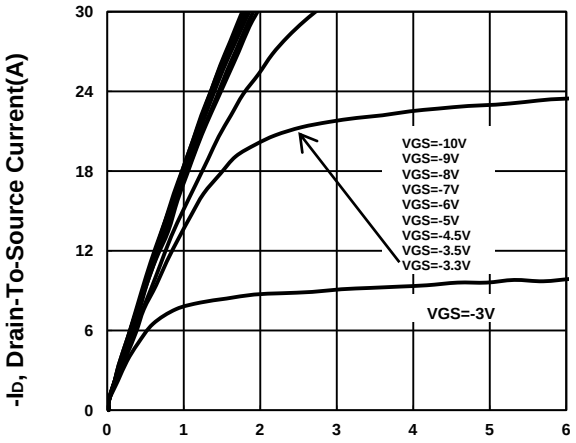
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

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	-100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-2	-3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±25V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -100V, V_{GS} = 0V			-1	μA
		V_{DS} = -100V, V_{GS} = 0V, T_J = 55 °C			-10	μA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -10A		55	69	mΩ
		V_{GS} = -10V, I_D = -15A		50	59	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -15A		46		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -50V, f = 1MHz		3868		pF
Output Capacitance	C_{oss}			155		pF
Reverse Transfer Capacitance	C_{rss}			109		pF
Gate Resistance	R_g	V_{GS} =0V, V_{DS} = 0V, f = 1MHz		3.1		Ω
Total Gate Charge[2]	$Q_{g\ (V_{GS}=-10V)}$	V_{DS} = -50V , V_{GS} = -10V, I_D = -15A		76		nC
	$Q_{g(V_{GS}=-4.5V)}$			38		nC
Gate-Source Charge[2]	Q_{gs}			12		nC
Gate-Drain Charge[2]	Q_{gd}			17		nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -50V , I_D ≅ -15A, V_{GS} = -10V, R_{GEN} =6Ω		18		nS
Rise Time[2]	t_r			51		nS
Turn-Off Delay Time[2]	$t_{d(off)}$			114		nS
Fall Time[2]	t_f			98		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-27	A
Forward Voltage[1]	V_{SD}	I_F = -15A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = -15A, dI_F/dt = 100A / μS		44		nS
Reverse Recovery Charge	Q_{rr}			69		nC

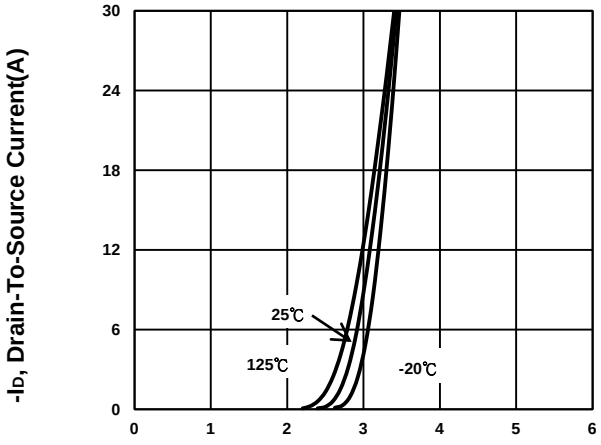
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

Output Characteristics



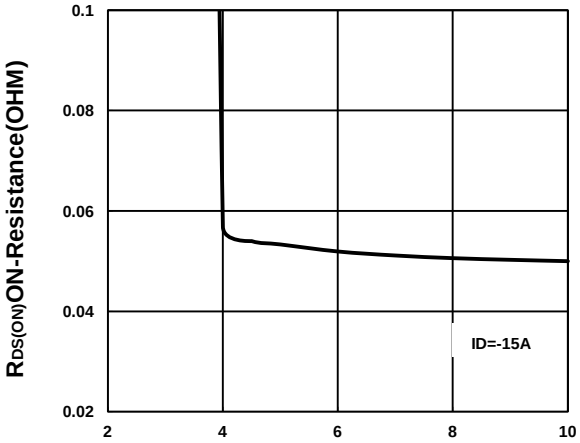
-VDS, Drain-To-Source Voltage(V)

Transfer Characteristics



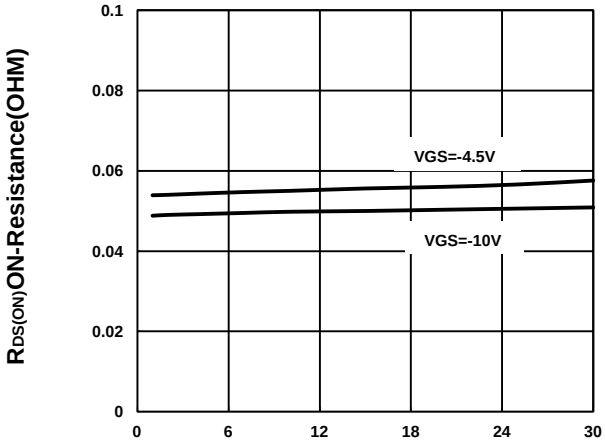
-VGS, Gate-To-Source Voltage(V)

On-Resistance VS Gate-To-Source Voltage



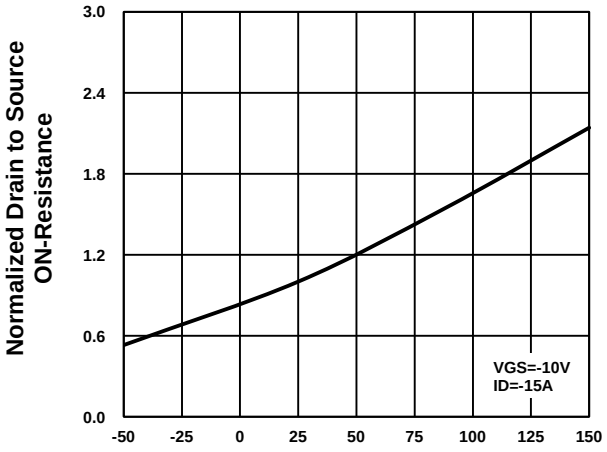
-VGS, Gate-To-Source Voltage(V)

On-Resistance VS Drain Current



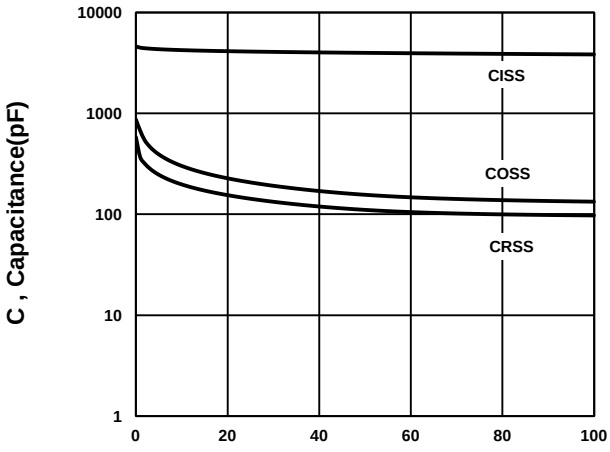
-ID , Drain-To-Source Current(A)

On-Resistance VS Temperature



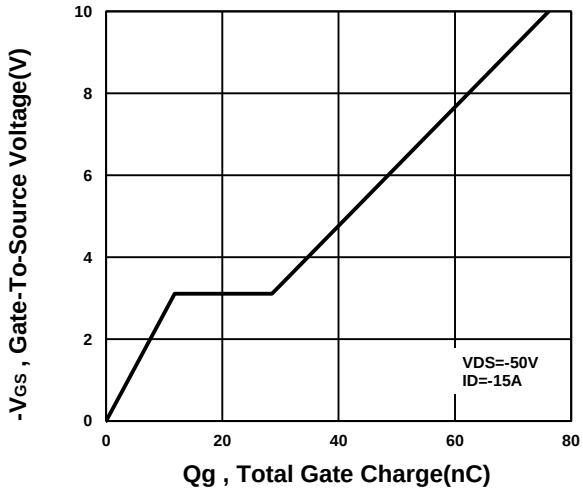
TJ , Junction Temperature(˚C)

Capacitance Characteristic

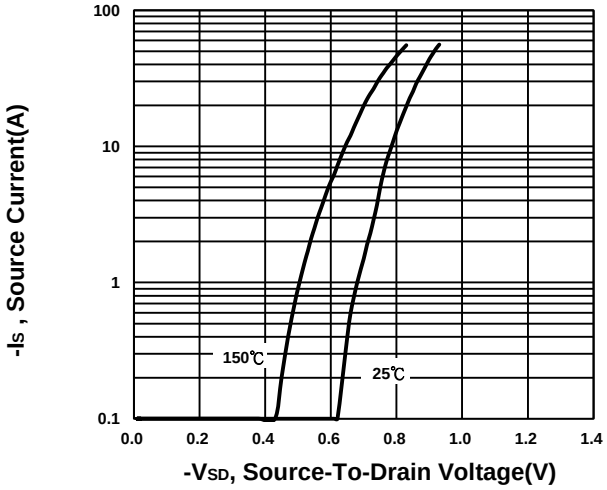


-VDS, Drain-To-Source Voltage(V)

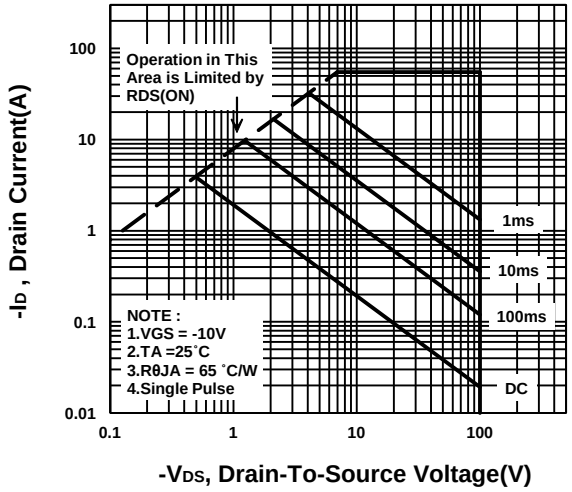
Gate charge Characteristics



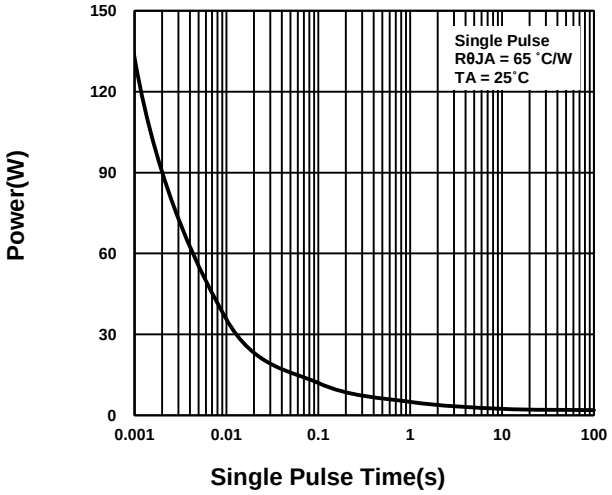
Source-Drain Diode Forward Voltage



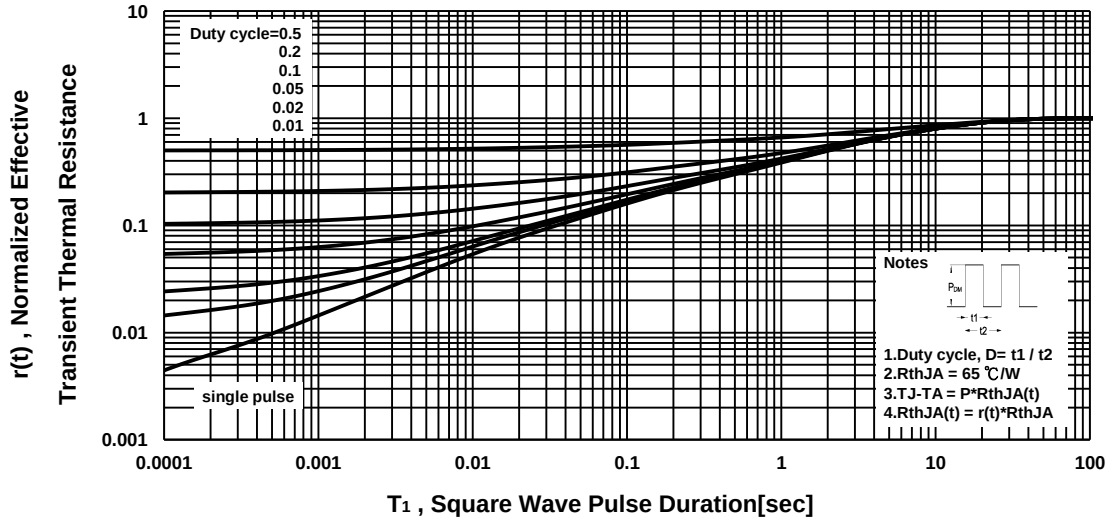
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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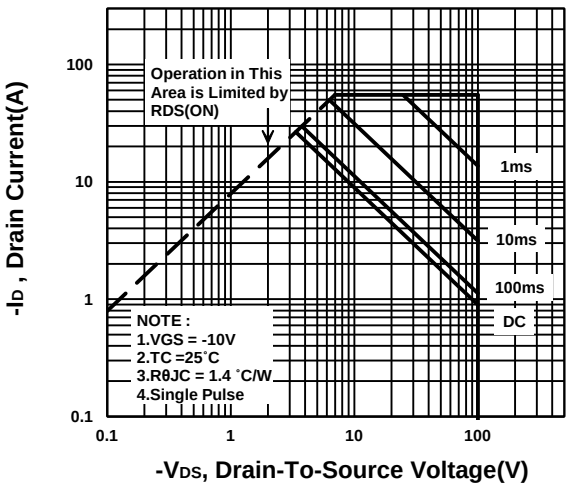

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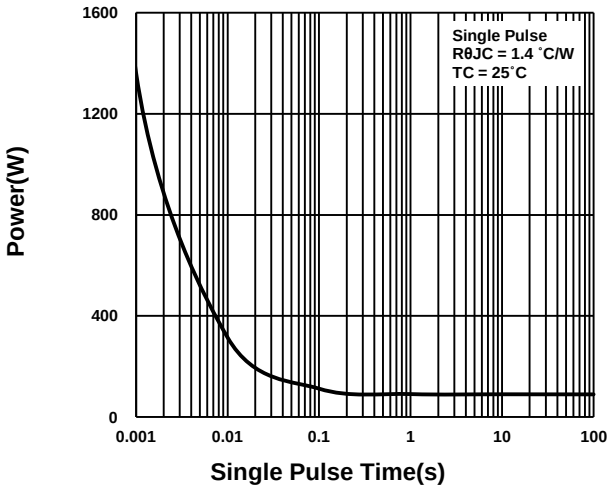

Transient Thermal Response Curve