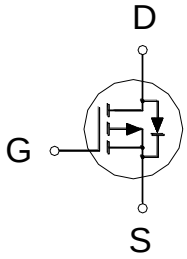
NIKO-SEM

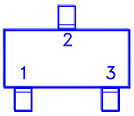
P-Channel Enhancement Mode Field Effect Transistor

PM513BA
SOT-23(S)
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-20V	100mΩ	-3A





1: GATE
2: DRAIN
3: SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A = 25 °C	I_D	-3	A
	T_A = 70 °C		-2.4	
Pulsed Drain Current[1]		I_{DM}	-20	
Power Dissipation	T_A = 25 °C	P_D	0.9	W
	T_A = 70 °C		0.6	
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]	$R_{\theta JA}$		130	°C / W

[1]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.

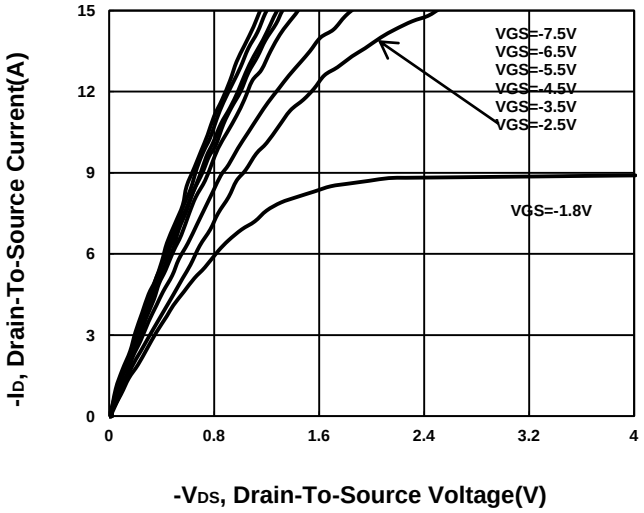
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.3	-0.5	-1	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			-1	μA
		V_{DS} = -10V, V_{GS} = 0V, T_J = 70 °C			-10	
Drain-Source On-State Resistance[1]	$R_{DS(on)}$	V_{GS} = -1.8V, I_D = -1A		140	190	mΩ
		V_{GS} = -2.5V, I_D = -2A		109	130	
		V_{GS} = -4.5V, I_D = -2.5A		80	100	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} =-5V, V_{GS} = -4.5V	-20			A
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -2.5A		8.1		S

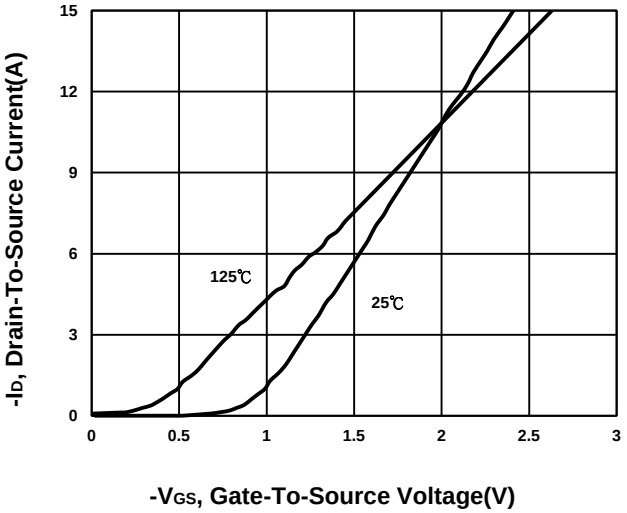
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz		434		pF
Output Capacitance	C_{oss}			56		
Reverse Transfer Capacitance	C_{rss}			54		
Total Gate Charge[2]	Qg	V_{DS} = -10V, I_D = -2.5A,V_{GS} = -4.5V		6.3		nC
Gate-Source Charge[2]	Q_{gs}			0.7		
Gate-Drain Charge[2]	Q_{gd}			2		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -10V $I_D \cong$ -2.5 A V_{GS} = -4.5V, R_{GEN} =6Ω		9.4		nS
Rise Time[2]	t_r			38		
Turn-Off Delay Time[2]	$t_{d(off)}$			60		
Fall Time[2]	t_f			66		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-3	A
Forward Voltage[1]	V_{SD}	I_F = -2.5A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = -2.5A, dI_F/dt = 100A / μS		11		nS
Reverse Recovery Charge	Q_{rr}			3		nC

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

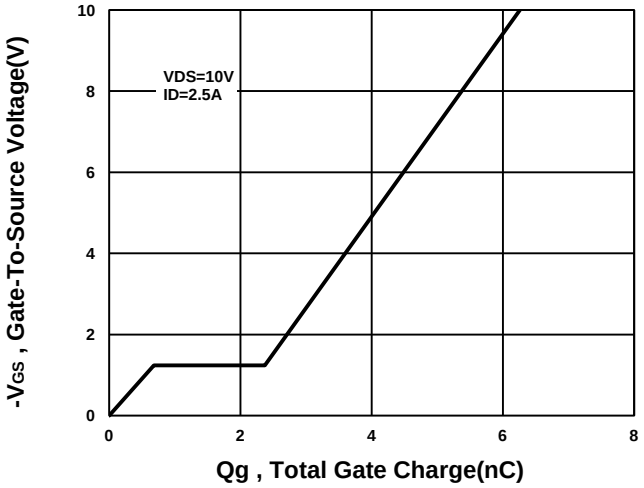
Output Characteristics



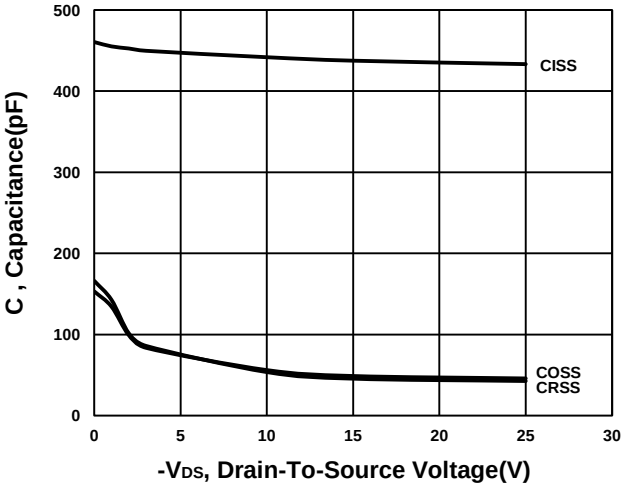
Transfer Characteristics



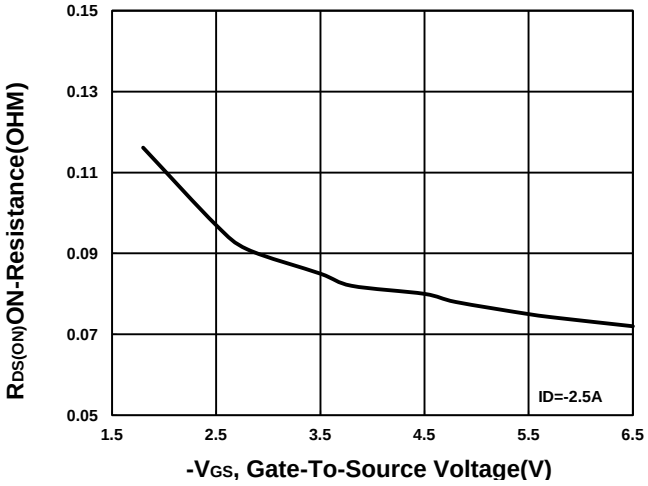
Gate charge Characteristics



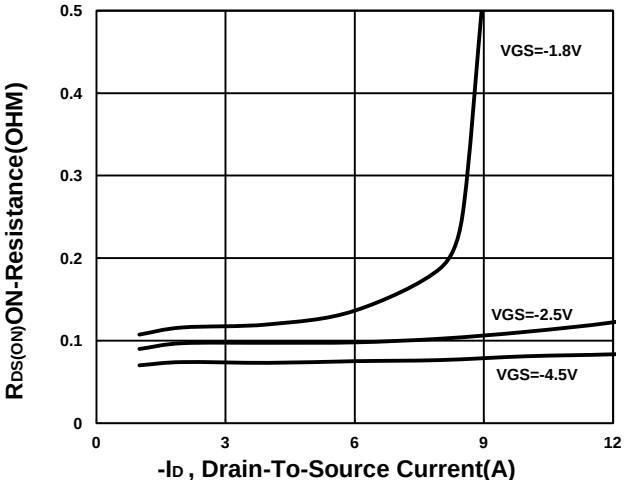
Capacitance Characteristic



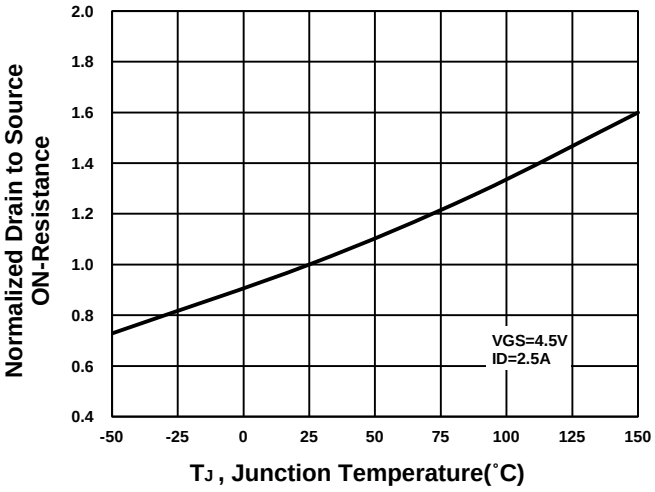
On-Resistance VS Gate-To-Source



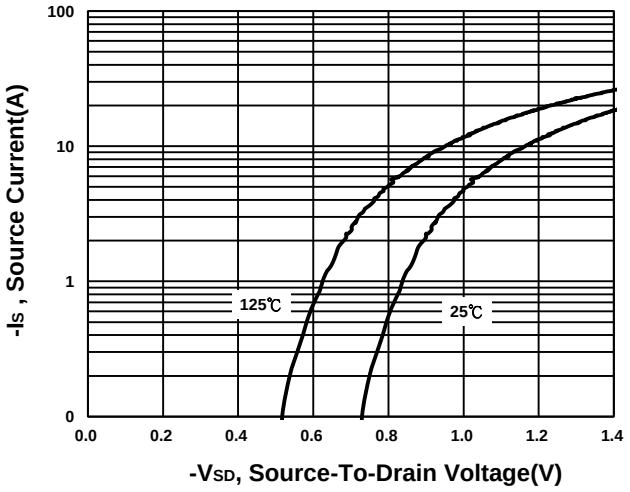
On-Resistance VS Drain Current



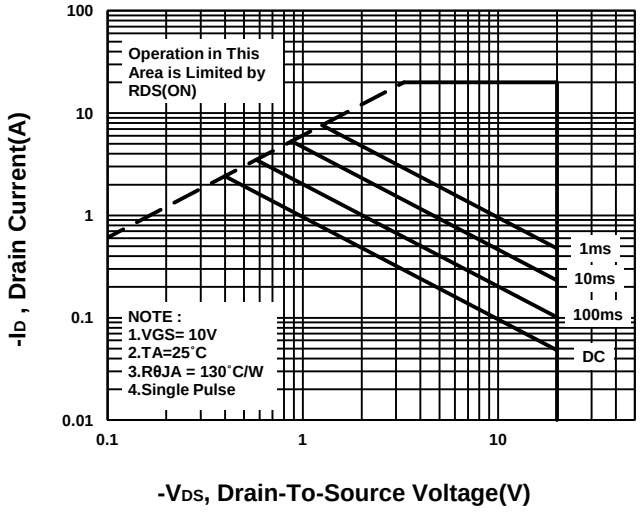
On-Resistance VS Temperature



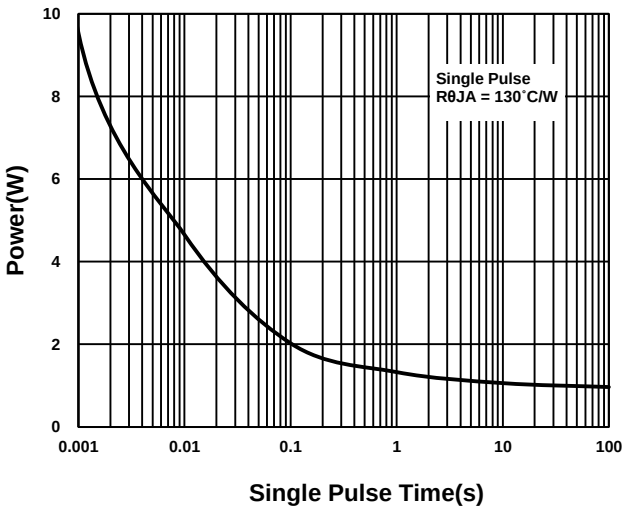
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve