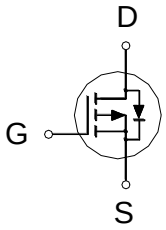
NIKO-SEM

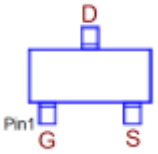
P-Channel Enhancement Mode Field Effect Transistor

PM505BA
SOT-23(S)
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-20V	40mΩ	-4A





G. GATE
D. DRAIN
S. SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A = 25 °C	I_D	-4	A
	T_A = 70 °C		-3	
Pulsed Drain Current[1]		I_{DM}	-21	
Power Dissipation	T_A = 25 °C	P_D	0.9	W
	T_A = 70 °C		0.6	
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]	$R_{\theta JA}$		126	°C/W

[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.

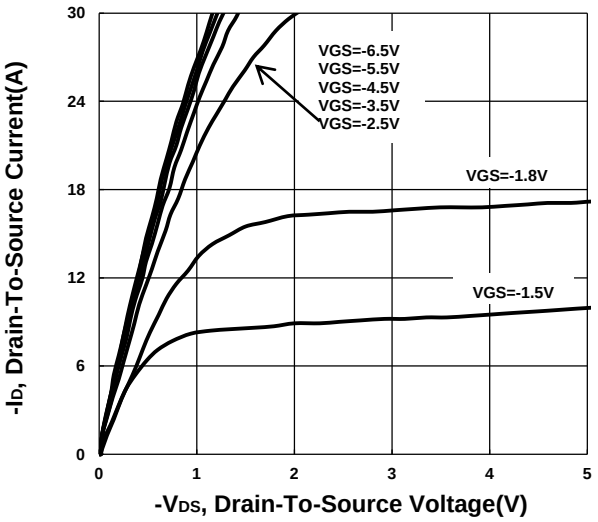
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

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	-0.6	-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 = 55 °C			-10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -1.5V, I_D = -1A		67	100	mΩ
		V_{GS} = -1.8V, I_D = -2A		50	71	
		V_{GS} = -2.5V, I_D = -3.5A		40	55	
		V_{GS} =-4.5V, I_D = -3.5A		33	40	

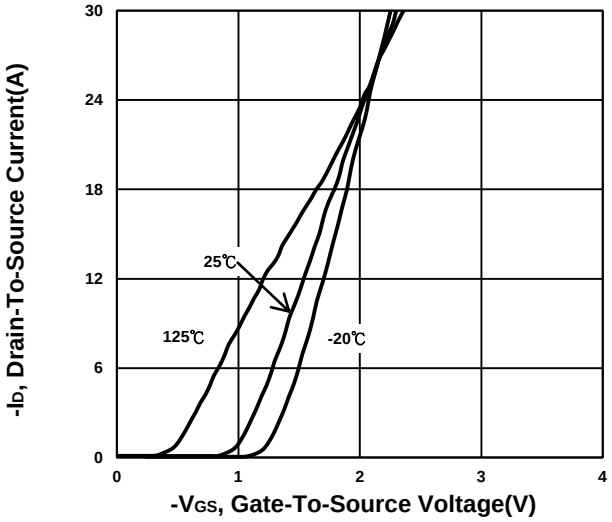
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -3.5A		17		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz		1157		pF
Output Capacitance	C_{oss}			106		
Reverse Transfer Capacitance	C_{rss}			76		
Total Gate Charge[2]	Q_g	V_{DS} = -10V , V_{GS} =-4.5V, I_D = -3.5A		11.9		nC
Gate-Source Charge[2]	Q_{gs}			1.6		
Gate-Drain Charge[2]	Q_{gd}			2.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = -10V, V_{GS} = -4.5V $I_D \cong$ -3.5A, R_G = 6Ω		22		nS
Rise Time[2]	t_r			20		
Turn-Off Delay Time[2]	$t_{d(off)}$			59		
Fall Time[2]	t_f			13		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-0.6	A
Forward Voltage[1]	V_{SD}	I_F = -3.5A, V_{GS} = 0V			-1.3	V
Reverse Recovery Time	t_{rr}	I_F = -3.5A, dI_F/dt = 100A / μS		11.4		nS
Reverse Recovery Charge	Qrr			2.9		nC

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

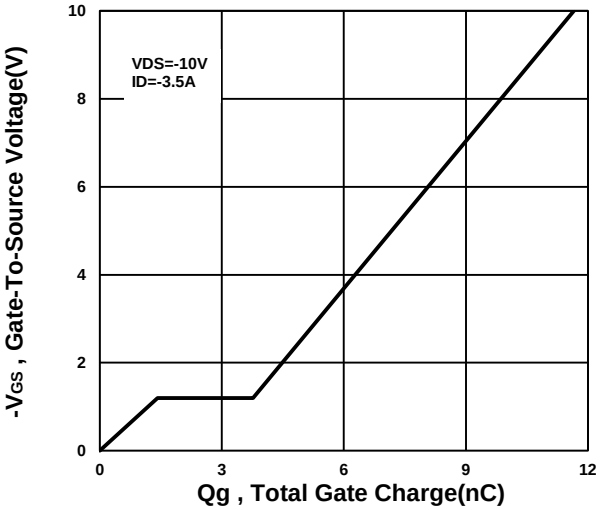
Output Characteristics



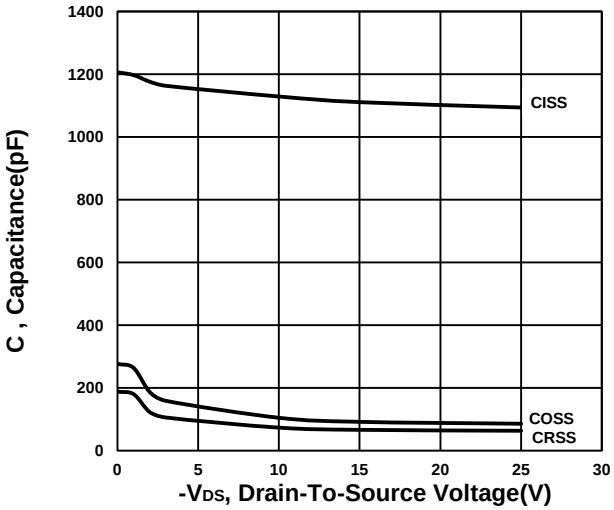
Transfer Characteristics



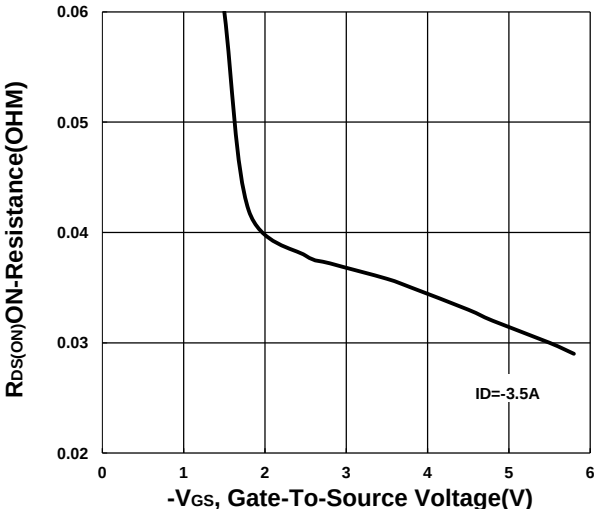
Gate charge Characteristics



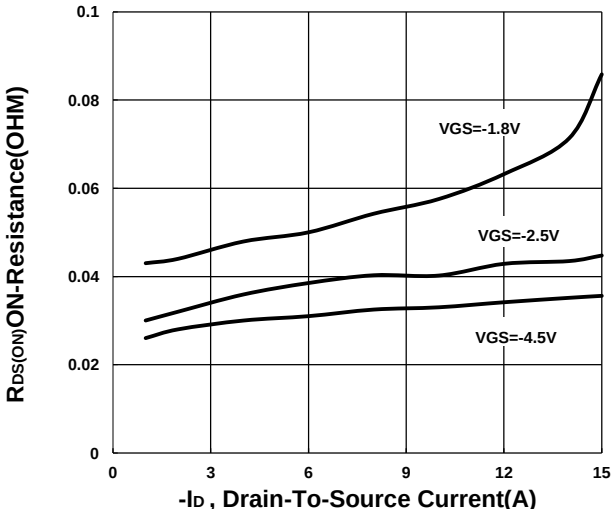
Capacitance Characteristic



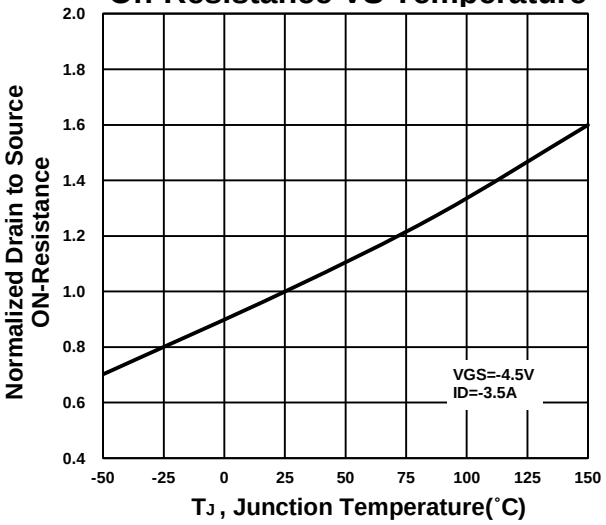
On-Resistance VS Gate-To-Source



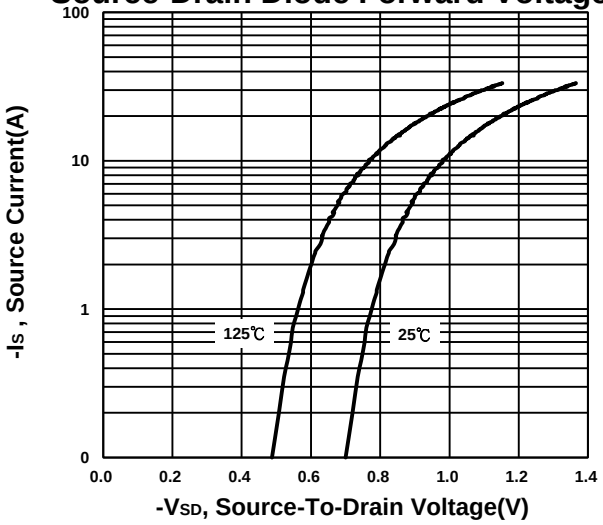
On-Resistance VS Drain Current



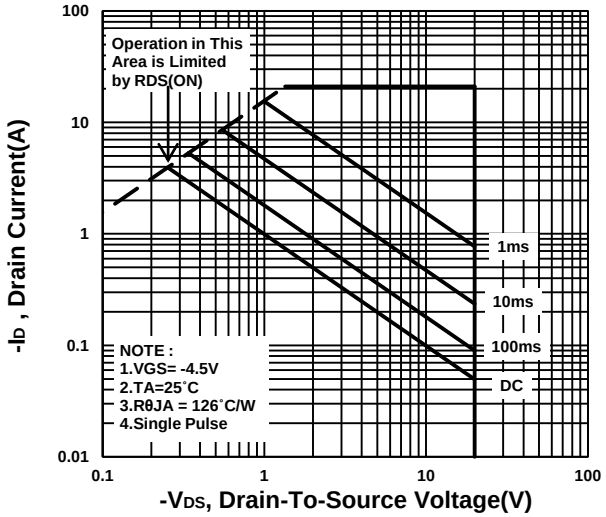
On-Resistance VS Temperature



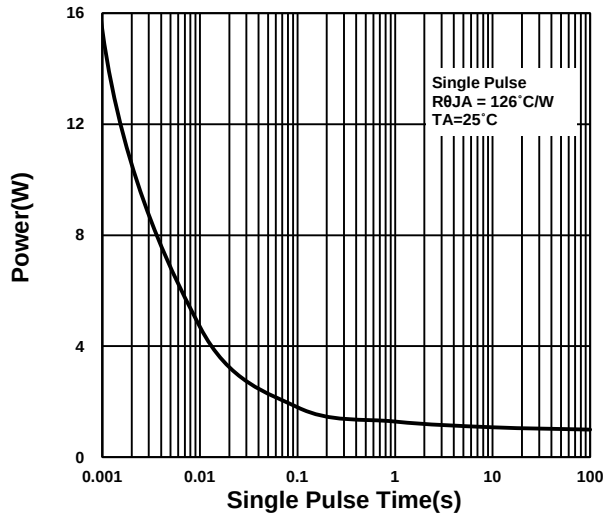
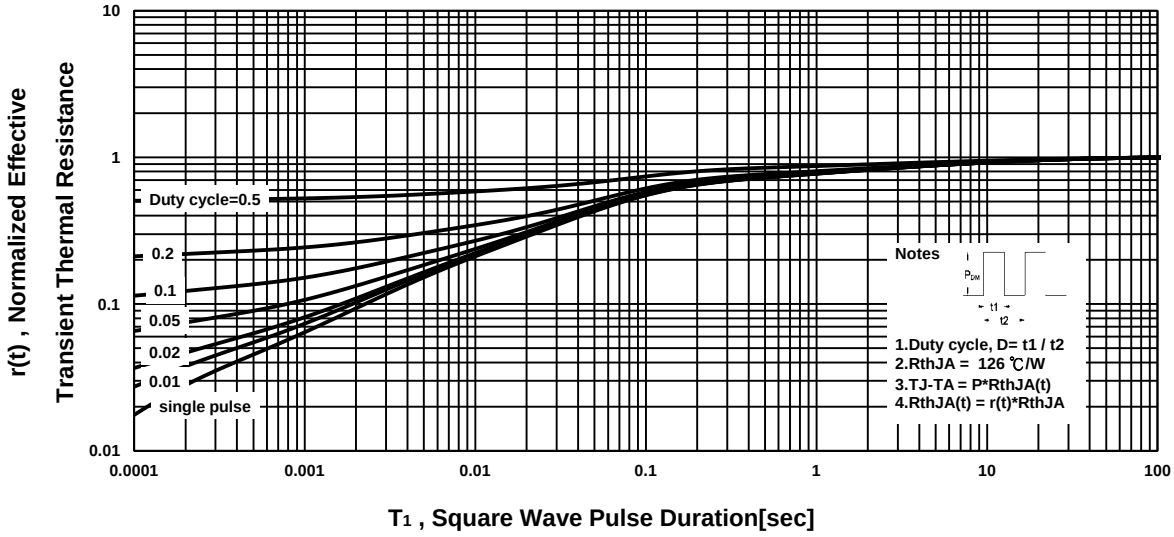
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve