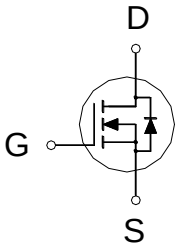
NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

PM5Q4BA
SOT-23(S)
Halogen-Free & Lead-Free

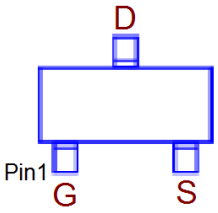
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
20V	25mΩ	5.3A



RoHS Compliant

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.



G. GATE
D. DRAIN
S. SOURCE

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
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A = 25 °C	I_D	5.3	A
	T_A = 70 °C		4.3	
Pulsed Drain Current[1]		I_{DM}	18	
Power Dissipation[3]	T_A = 25 °C	P_D	1.25	W
	T_A = 70 °C		0.8	
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	$R_{\theta JA}$		100	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		128	

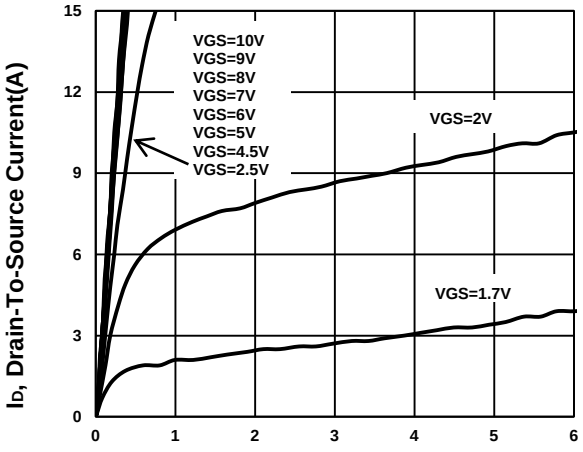
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

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

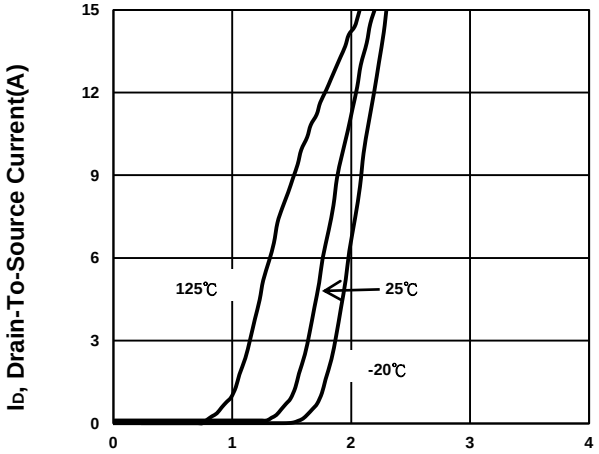
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.45	1	1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
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} = 2.5V, I_D = 4A		35	50	mΩ
		V_{GS} = 4.5V, I_D = 5A		23	32	
		V_{GS} = 10V, I_D = 5A		20	25	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 5A		22.5		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		389		pF
Output Capacitance	C_{oss}			79		
Reverse Transfer Capacitance	C_{rss}			66		
Gate Resistance	Rg	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.7		Ω
Total Gate Charge[2]	$Q_{g(VGS=10V)}$	V_{DS} = 10V, I_D = 5A		10		nC
	$Q_{g(VGS=4.5V)}$			5.3		
Gate-Source Charge[2]	Q_{gs}			0.5		
Gate-Drain Charge[2]	Q_{gd}			2.2		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 10V, I_D ≅ 5A, V_{GS} = 10V, R_{GS} = 6Ω		7.3		nS
Rise Time[2]	t_r			40		
Turn-Off Delay Time[2]	$t_{d(off)}$			23		
Fall Time[2]	t_f			4.7		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				0.8	A
Forward Voltage[1]	V_{SD}	I_F = 5A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 5A, dI/dt = 100 A/μs		7.6		nS
Reverse Recovery Charge	Q_{rr}			2.3		nC

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

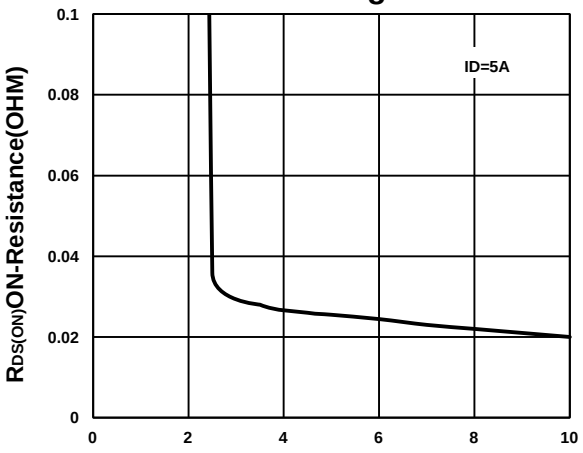
Output Characteristics



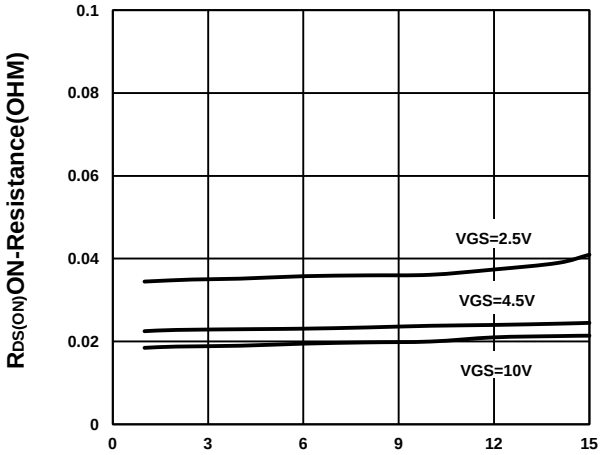
Transfer Characteristics



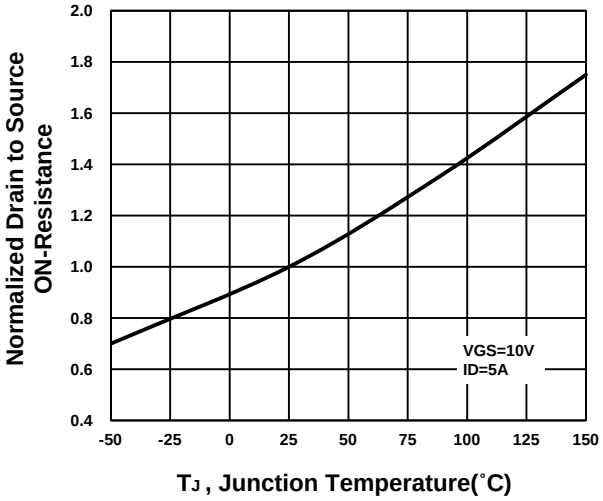
On-Resistance VS Gate-To-Source Voltage



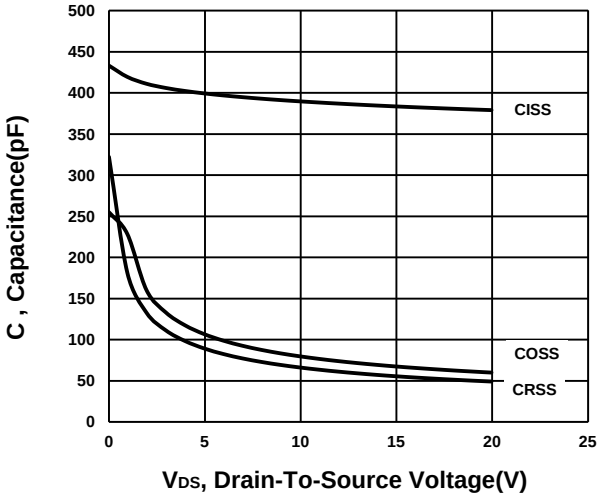
On-Resistance VS Drain Current



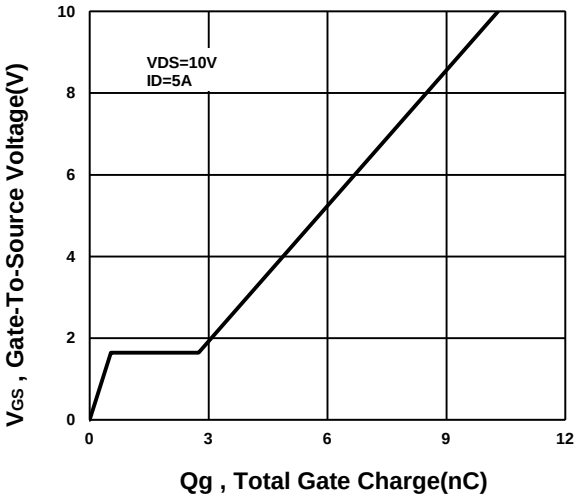
On-Resistance VS Temperature



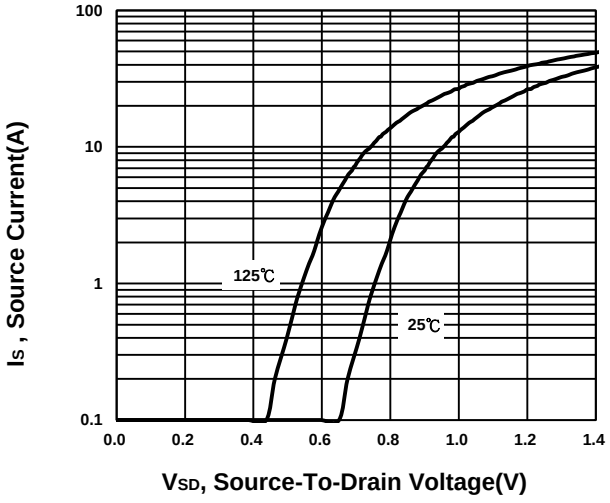
Capacitance Characteristic



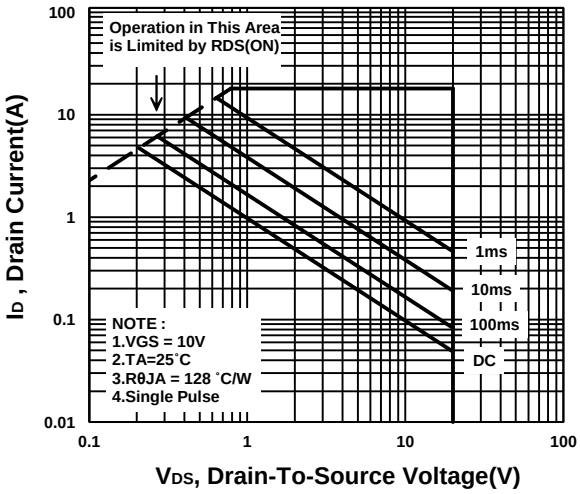
Gate charge Characteristics



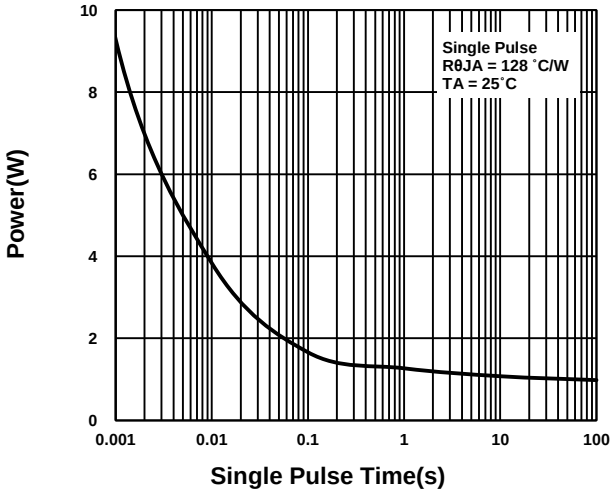
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve