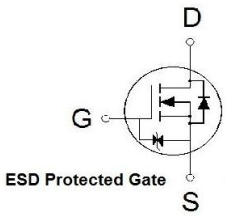
NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

PM5D8EA
SOT-23(S)
Halogen-Free & Lead-Free

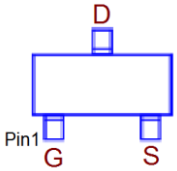
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
20V	300mΩ	1A



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.
- ESD Protection − HBM Class : 1C.

Applications
- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.
- Space Limit & Smart Devices Applications.



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}	±10	V
Continuous Drain Current[2]	T_A = 25 °C	I_D	1	A
	T_A = 70 °C		0.8	
Pulsed Drain Current[1,2]		I_{DM}	3	A
Power Dissipation	T_A = 25 °C	P_D	0.6	W
	T_A = 70 °C		0.39	
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	$R_{\theta JA}$		205	°C / W

[1]Limited by maximum junction temperature.
[2]Limited by package.

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

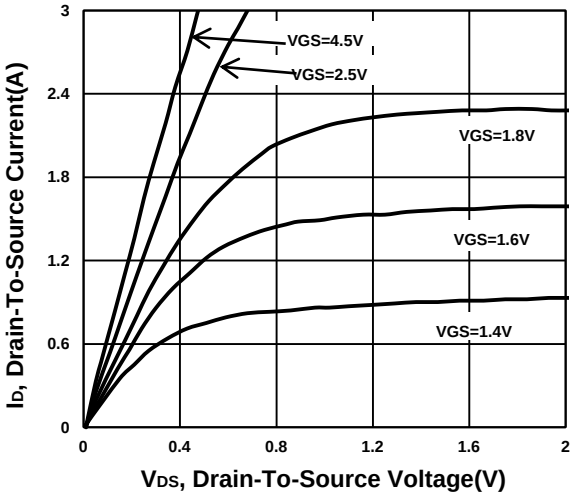
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.7	1	

Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±10	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			1	μA
		V_{DS} = 10V, V_{GS} = 0V, T_J = 125 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 0.5A		148	300	mΩ
		V_{GS} = 2.5V, I_D = 0.25A		193	400	
		V_{GS} = 1.8V, I_D = 0.2A		261	700	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 0.5A		2.5		S

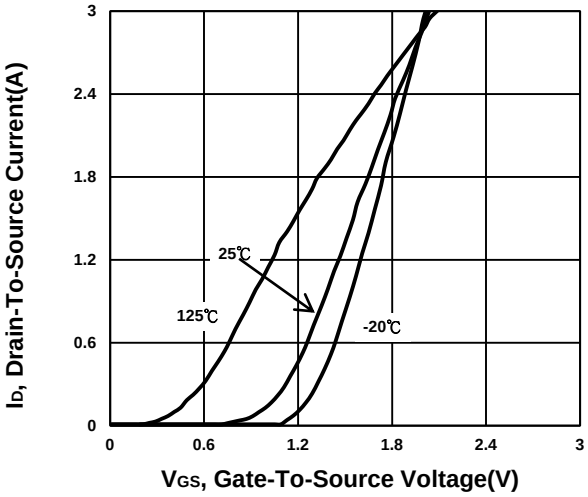
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		60		pF
Output Capacitance	C_{oss}			19		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge[2]	Q_g	V_{GS} = 4.5V , V_{DS} = 20V, I_D = 1A		1.1		nC
Gate-Source Charge[2]	Q_{gs}			0.2		
Gate-Drain Charge[2]	Q_{gd}			0.3		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 10V , $I_D \cong$ 0.5A , V_{GS} = 4.5V, R_{GEN} = 5.1Ω		17		nS
Rise Time[2]	t_r			36		
Turn-Off Delay Time[2]	$t_{d(off)}$			86		
Fall Time[2]	t_f			173		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				0.5	A
Forward Voltage[1]	V_{SD}	I_F = 0.5A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 1A, dI/dt = 100 A/μs		111		nS
Reverse Recovery Charge	Q_{rr}			102		uC

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

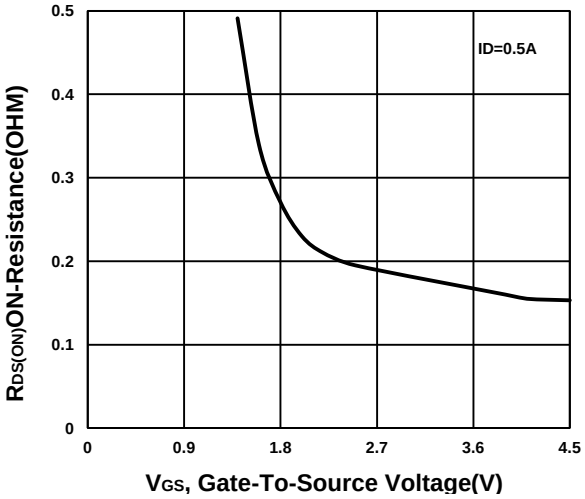
Output Characteristics



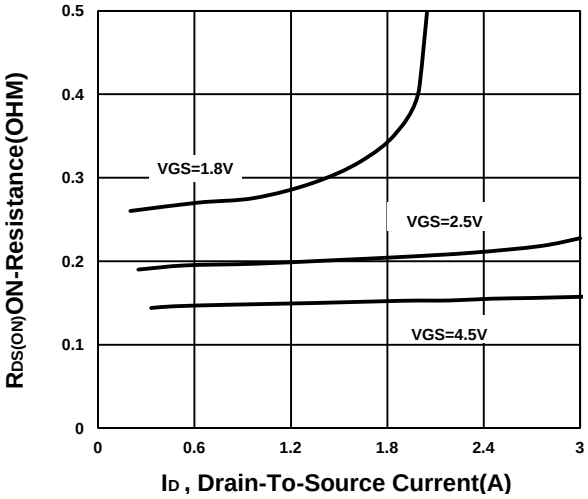
Transfer Characteristics



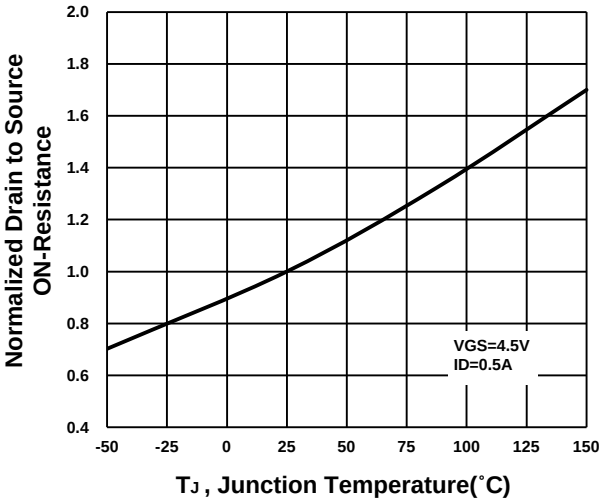
On-Resistance VS Gate-To-Source



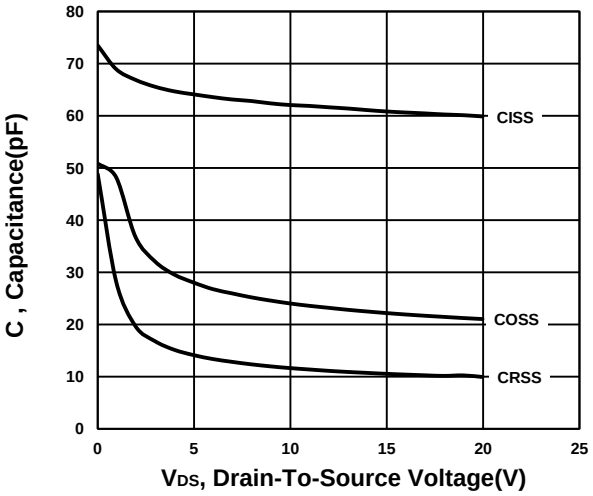
On-Resistance VS Drain Current



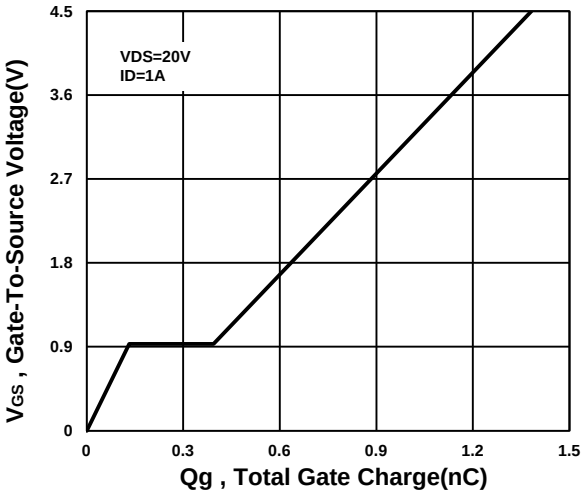
On-Resistance VS Temperature



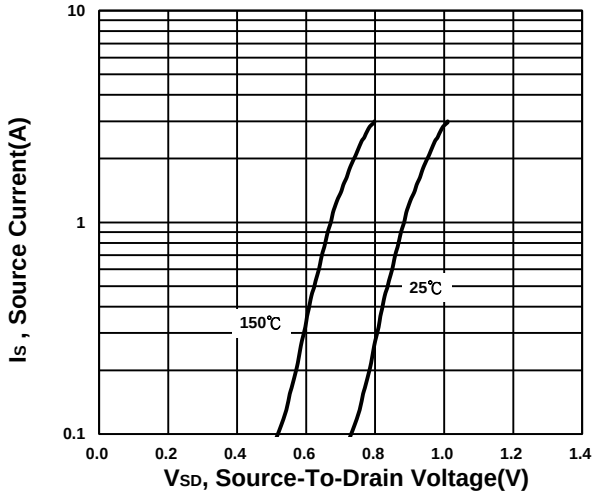
Capacitance Characteristic



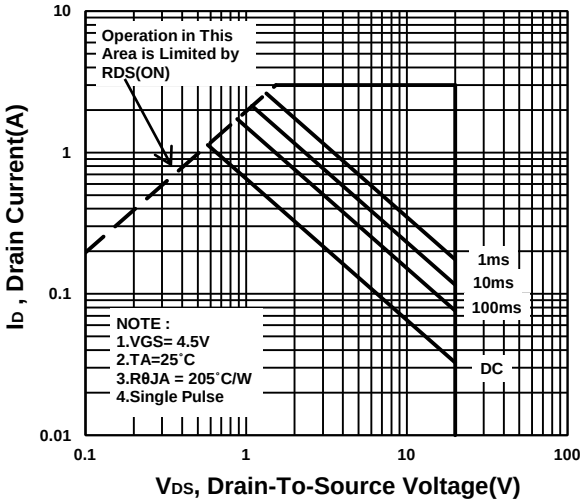
Gate charge Characteristics



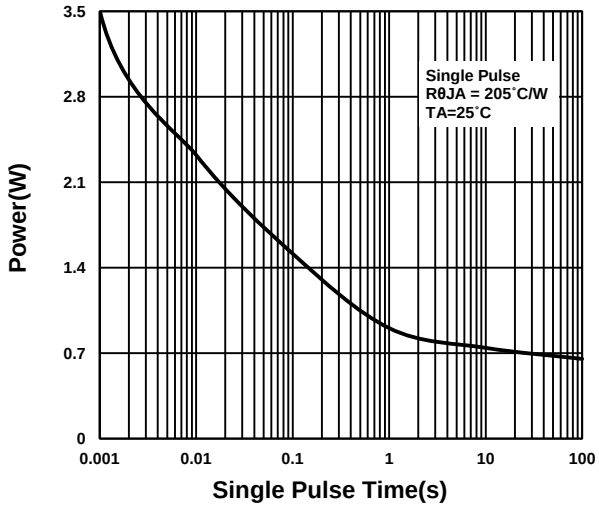
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve