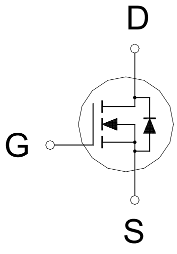
NIKO-SEM

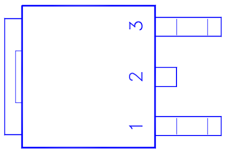
N-Channel Enhancement Mode Field Effect Transistor

P1020HDB
TO-252
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
200V	325mΩ	10A





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}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 ° C	I_D	10	A
	T_C = 100 ° C		6.3	
Pulsed Drain Current[1]		I_{DM}	26	
Avalanche Current		I_{AS}	6.5	
Avalanche Energy	L = 1mH	E_{AS}	21.1	mJ
Power Dissipation	T_C = 25 ° C	P_D	52	W
	T_C = 100 ° C		20	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	° C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		62.5	° C / W
Junction-to-Case	$R_{\theta JC}$		2.4	

[1] Pulse width limited by maximum junction temperature.

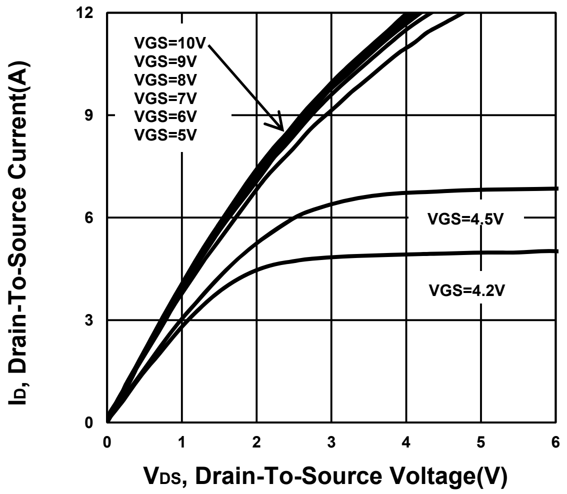
.ELECTRICAL CHARACTERISTICS (T_J = 25 ° C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	200			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1	2	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA

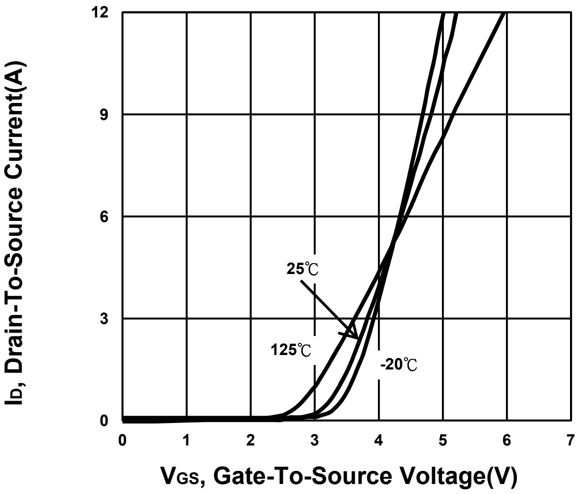
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V			1	µA
		V_{DS} = 160V, V_{GS} = 0V, T_J = 125 ° C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} =10V, I_D = 5A		261	325	mΩ
		V_{GS} =4.5V, I_D = 5A		364	440	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 5A		6		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		372		pF
Output Capacitance	C_{oss}			69		
Reverse Transfer Capacitance	C_{rss}			11		
Total Gate Charge[2]	Q_g	V_{DS} = 160V , I_D =10A , V_{GS} = 10V		12.7		nC
Gate-Source Charge[2]	Q_{gs}			1.7		
Gate-Drain Charge[2]	Q_{gd}			5.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 100V , $I_D \cong$ 10A, V_{GS} = 10V, R_{GEN} = 6Ω		10		nS
Rise Time[2]	t_r			30		
Turn-Off Delay Time[2]	$t_{d(off)}$			24		
Fall Time[2]	t_f			35		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 ° C)						
Continuous Current[3]	I_S				10	A
Forward Voltage[1]	V_{SD}	I_F = 10A, V_{GS} = 0V			1	V
Diode Reverse Recovery Time	t_{rr}	I_F= 10A, dI/dt=100A/µs		103		nS
Diode Reverse Recovery Charge	Q_{rr}			377		nC

[1] Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.
[2] Independent of operating temperature.
[3] Pulse width limited by maximum junction temperature.

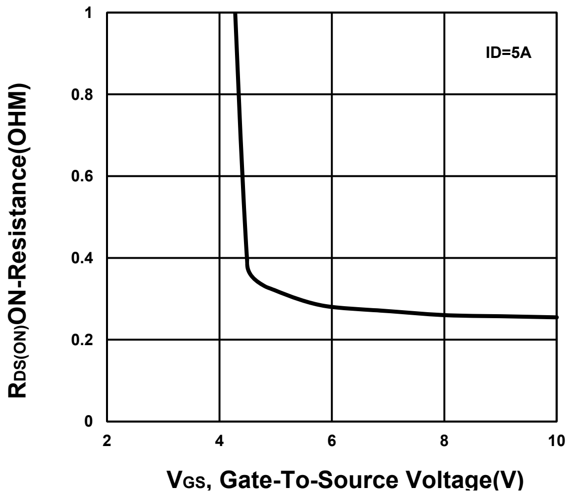
Output Characteristics



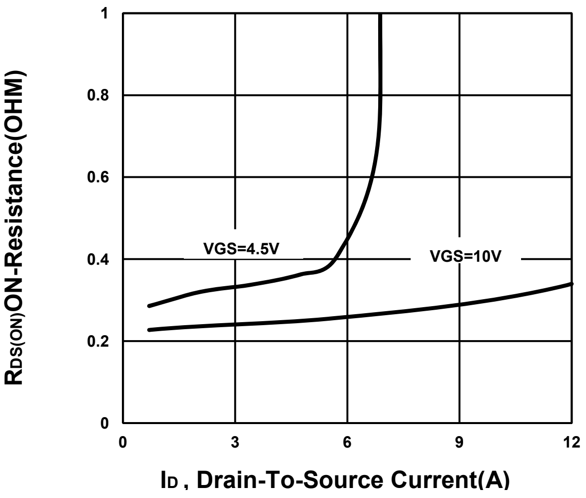
Transfer Characteristics



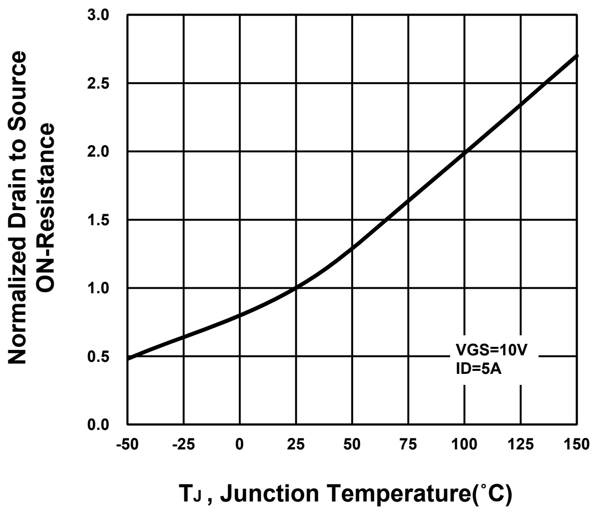
On-Resistance VS Gate-To-Source



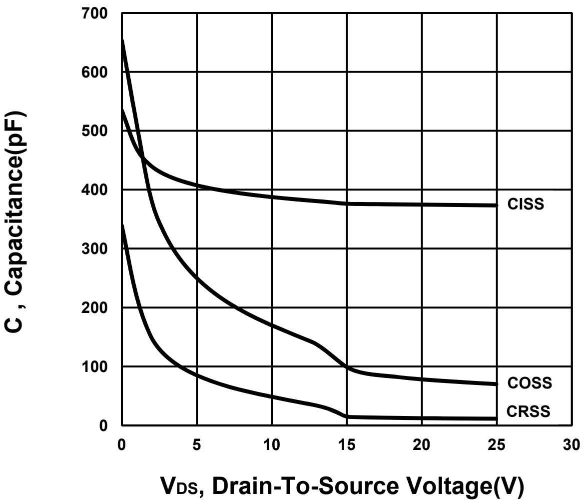
On-Resistance VS Drain Current



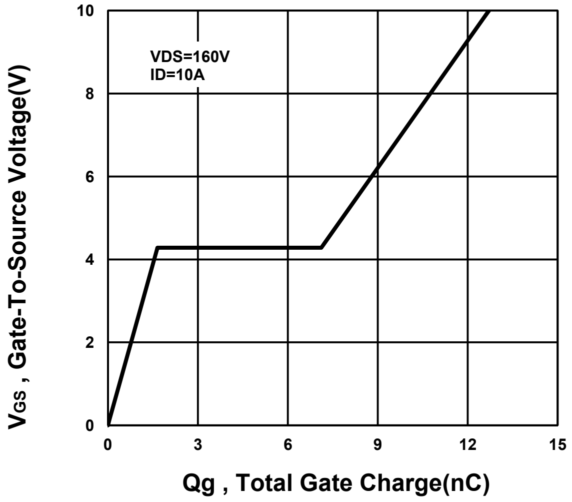
On-Resistance VS Temperature



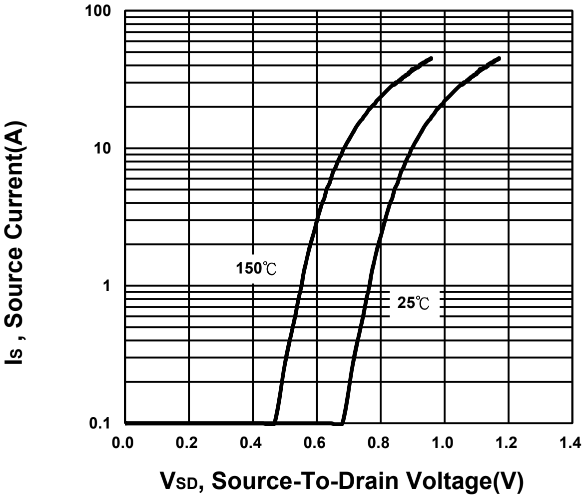
Capacitance Characteristic



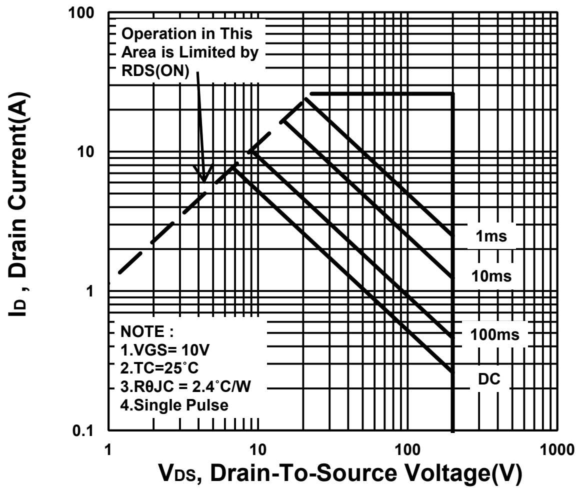
Gate charge Characteristics



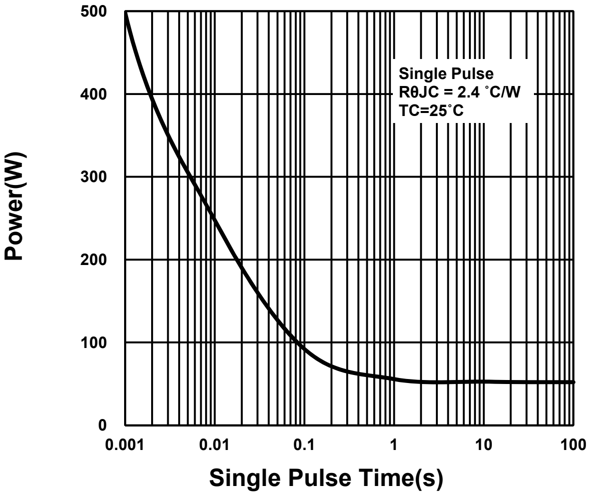
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve