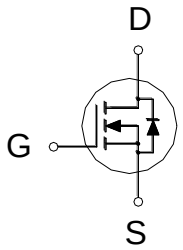
NIKO-SEM

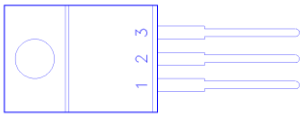
N-Channel Enhancement Mode Field Effect Transistor

P1006BT
TO-220
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
60V	10mΩ	61A





RoHS Compliant

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}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[2]	T_C = 25 ° C	I_D	61	A
	T_C = 100 ° C		39	
Pulsed Drain Current[1]		I_{DM}	150	
Avalanche Current		I_{AS}	39	
Avalanche Energy	L = 0.1mH	E_{AS}	77	mJ
Power Dissipation	T_C = 25 ° C	P_D	83	W
	T_C = 100 ° C		33	
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	$R_{\theta JC}$		1.5	

[1]Pulse width limited by maximum junction temperature.
[2]Package limitation current is 30A.

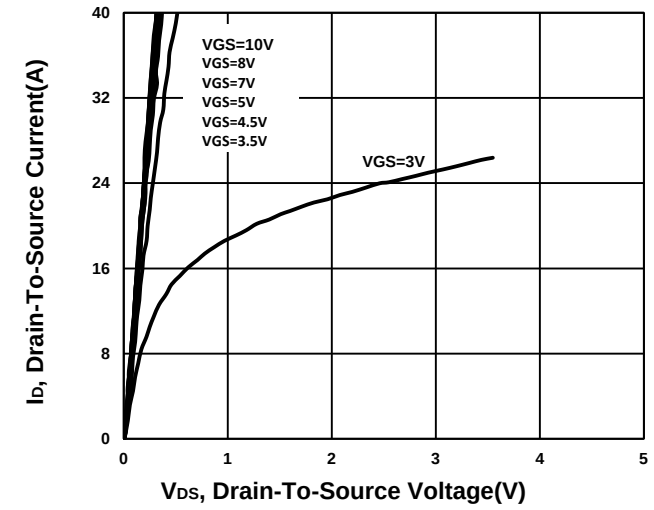
.ELECTRICAL CHARACTERISTICS (T_J = 25 ° C, Unless Otherwise Noted)

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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.3	1.7	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	µA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 125 ° C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 20A		8.2	13	mΩ
		V_{GS} =10V, I_D = 20A		6.8	10	

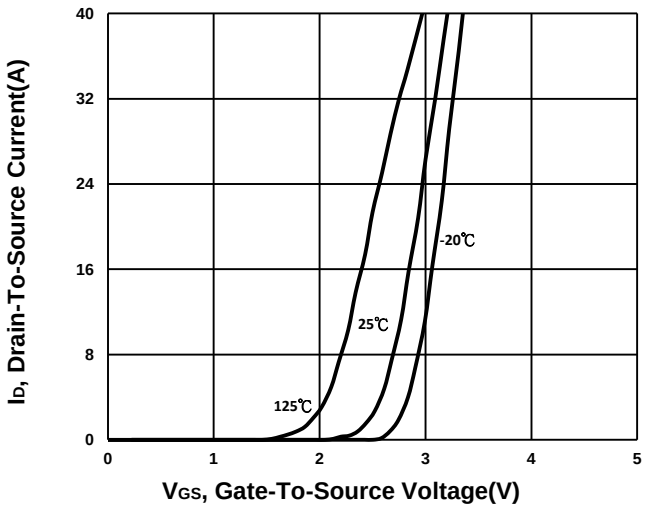
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 20A		60		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1853		pF
Output Capacitance	C_{oss}			224		
Reverse Transfer Capacitance	C_{rss}			142		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		0.8		Ω
Total Gate Charge[2]	$Q_{g(VGS=10V)}$	V_{DS} = 30V , I_D =20A		42.2		nC
	$Q_{g(VGS=4.5V)}$			23.1		
Gate-Source Charge[2]	Q_{gs}			5.6		
Gate-Drain Charge[2]	Q_{gd}			12.8		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 30V , $I_D \cong$ 20A, V_{GS} = 10V, R_{GEN} =6Ω		30		nS
Rise Time[2]	t_r			29		
Turn-Off Delay Time[2]	$t_{d(off)}$			50		
Fall Time[2]	t_f			33		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 ° C)						
Continuous Current[3]	I_S				61	A
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.3	V
Diode Reverse Recovery Time	t_{rr}	I_F= 20A, dI/dt=100A/μs		29		nS
Diode Reverse Recovery Charge	Q_{rr}			27		uC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Package limitation current is 30A

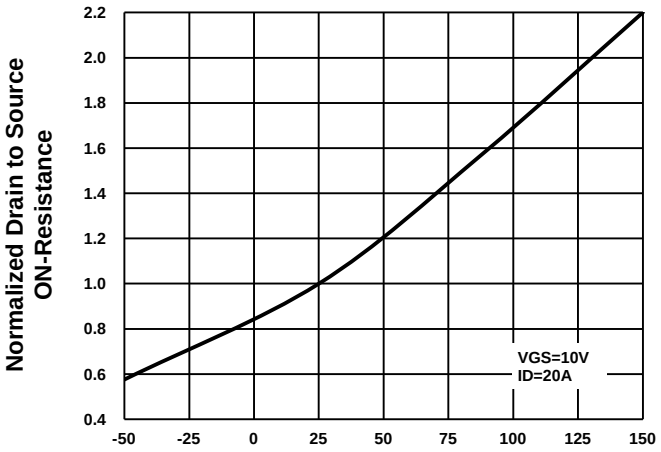
Output Characteristics



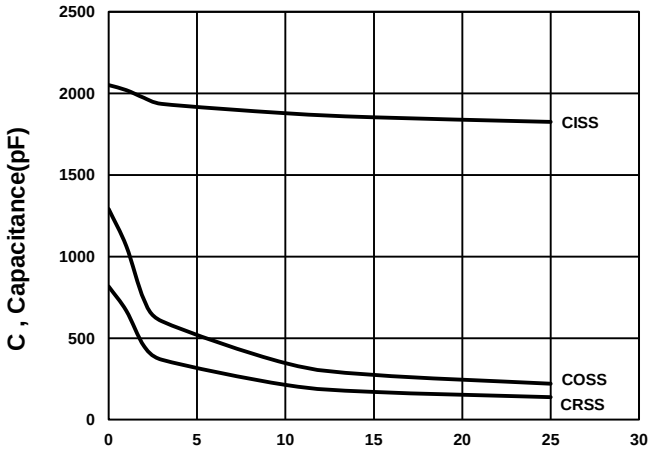
Transfer Characteristics



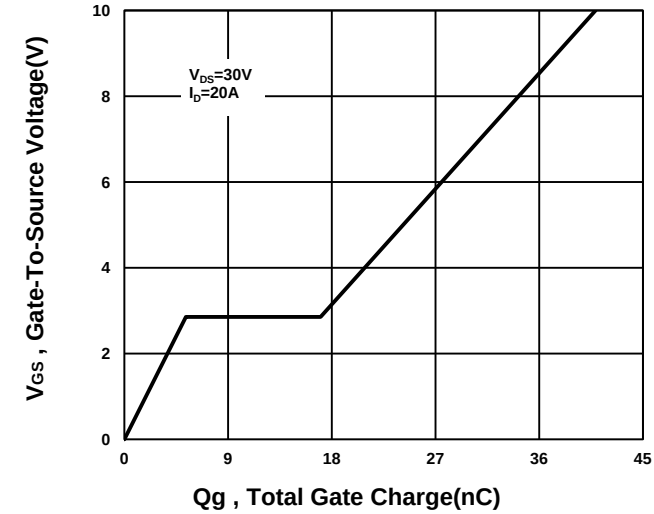
On-Resistance VS Temperature



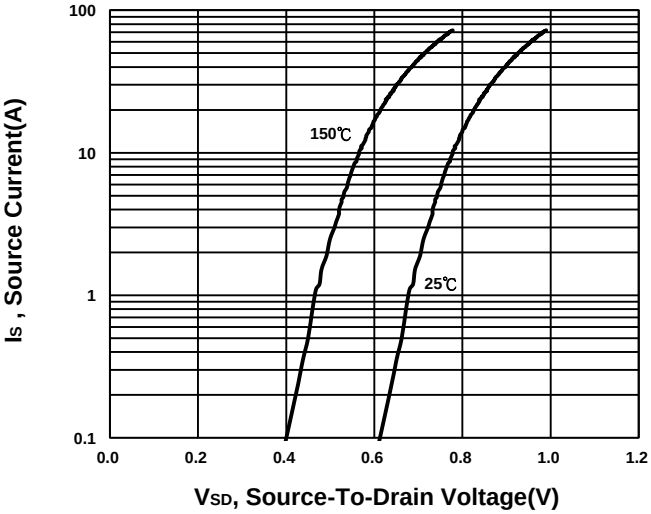
Capacitance Characteristic



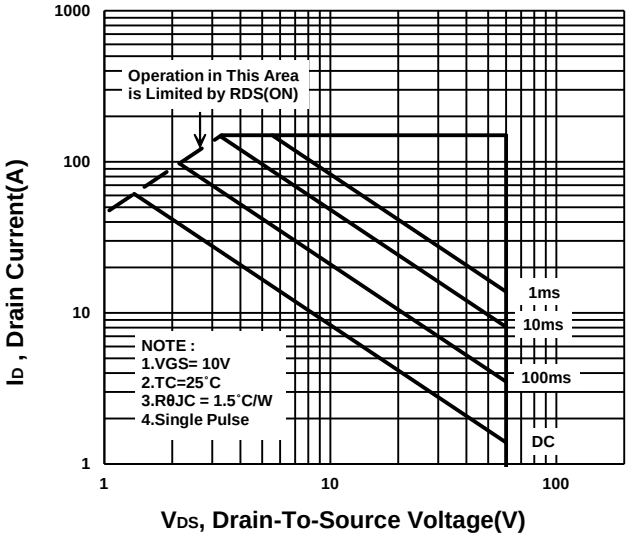
Gate charge Characteristics



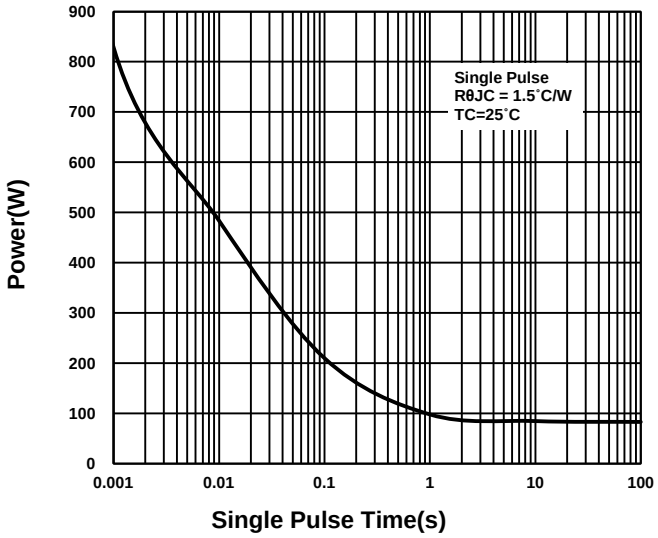
Source-Drain Diode Forward Voltage



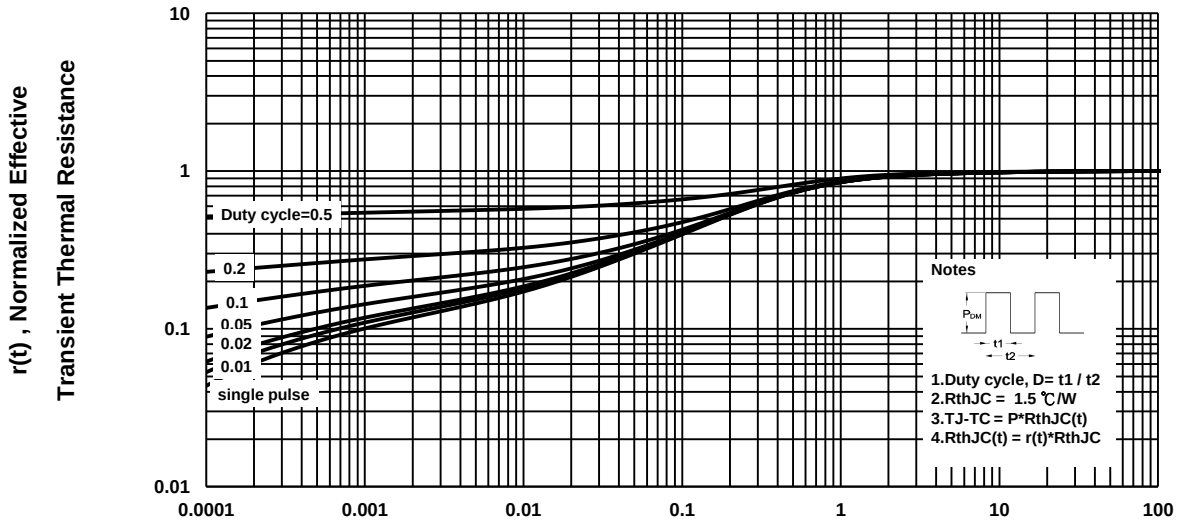
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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