NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

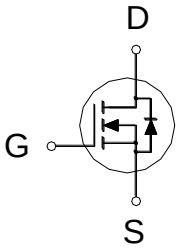
P1650GTF

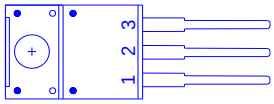
TO-220F

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
500V	360mΩ	16A





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}	500	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	16	A
	T_C = 100 °C		10	
Pulsed Drain Current[1, 2]		I_{DM}	60	
Avalanche Current[3]		I_{AS}	9	
Avalanche Energy[3]		E_{AS}	410	mJ
Power Dissipation	T_C = 25 °C	P_D	56.8	W
	T_C = 100 °C		22.7	
Operating Junction & Storage Temperature Range		Tj, Tstg	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2.2	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.
[2]Limited only by maximum temperature allowed
[3]V_{DD} = 50V , L = 10mH, starting T_J = 25°C

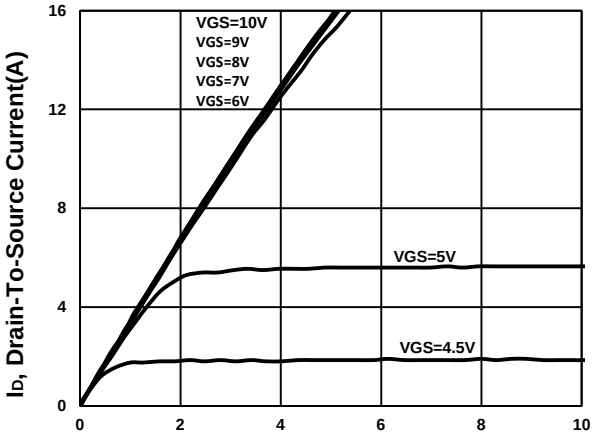
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	500			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	2.7	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V			±100	nA

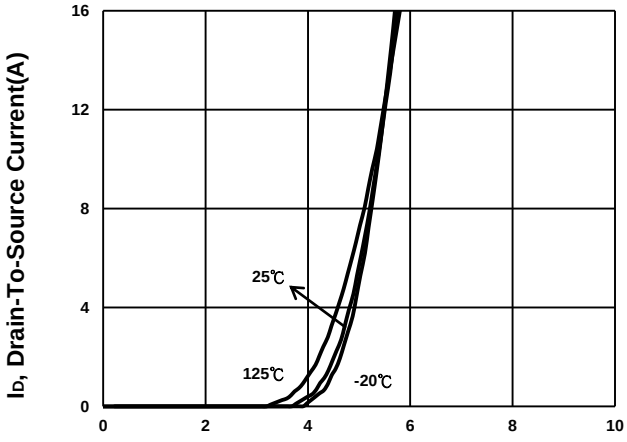
Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V , T_C = 25 °C			1	μA
		V_{DS} = 400V, V_{GS} = 0V , T_C = 100 °C			100	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 8A		296	360	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 8A		16		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		2707		pF
Output Capacitance	C_{oss}			236		
Reverse Transfer Capacitance	C_{rss}			17		
Total Gate Charge[2]	Q_g	V_{DD} = 400V, I_D = 16A, V_{GS} = 10V		59		nC
Gate-Source Charge[2]	Q_{gs}			17		
Gate-Drain Charge[2]	Q_{gd}			18		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 250V, I_D = 16A, R_G= 25Ω		45		nS
Rise Time[2]	t_r			180		
Turn-Off Delay Time[2]	$t_{d(off)}$			130		
Fall Time[2]	t_f			100		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				16	A
Forward Voltage[1]	V_{SD}	I_F =16A, V_{GS} = 0V			1	V
Reverse Recovery Time	t_{rr}	I_F = 16A, dI_F/dt = 100A / μS		376		nS
Reverse Recovery Charge	Q_{rr}			5.2		uC

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

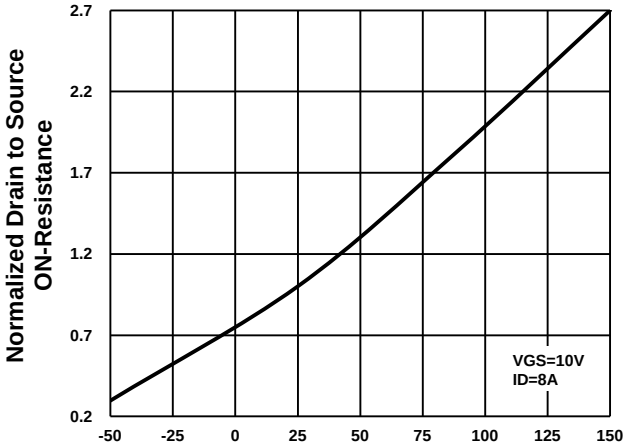
Output Characteristics



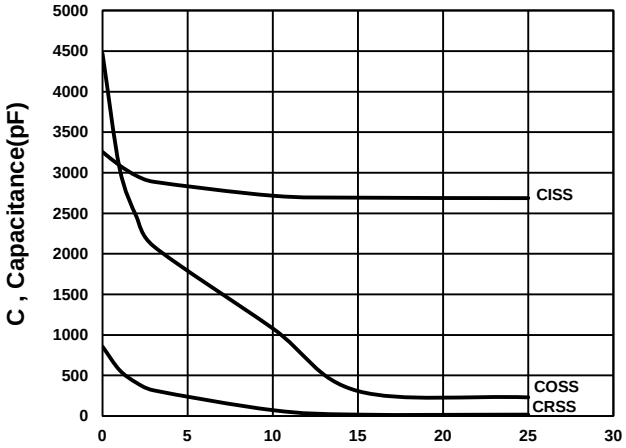
Transfer Characteristics



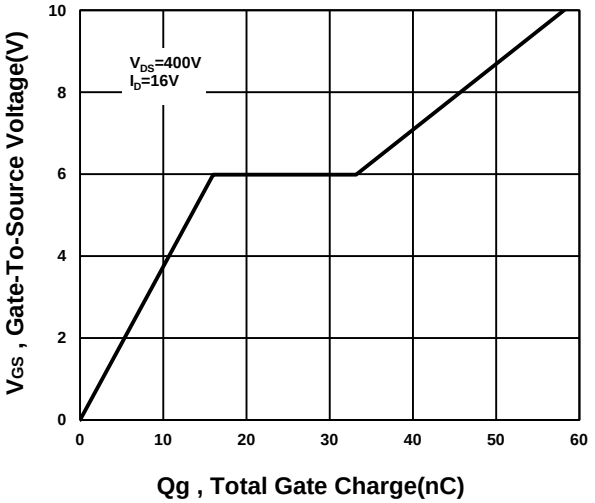
On-Resistance VS Temperature



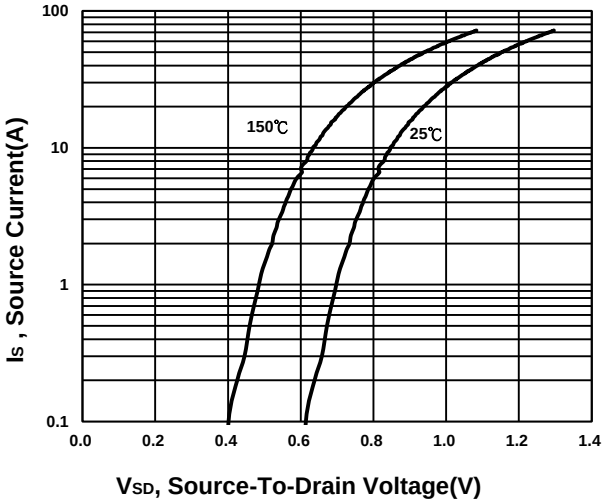
Capacitance Characteristic



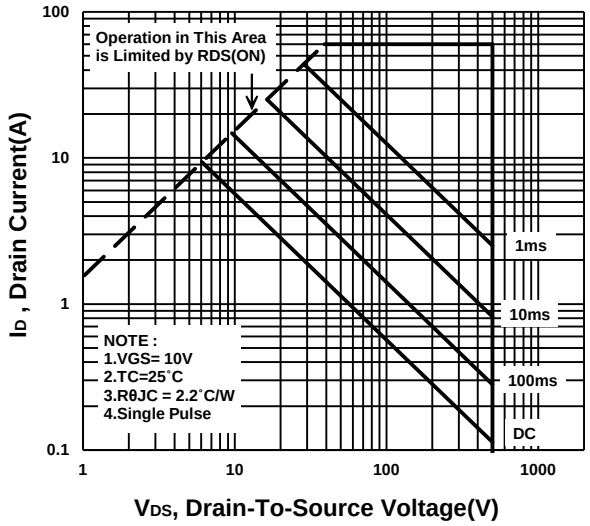
Gate charge Characteristics



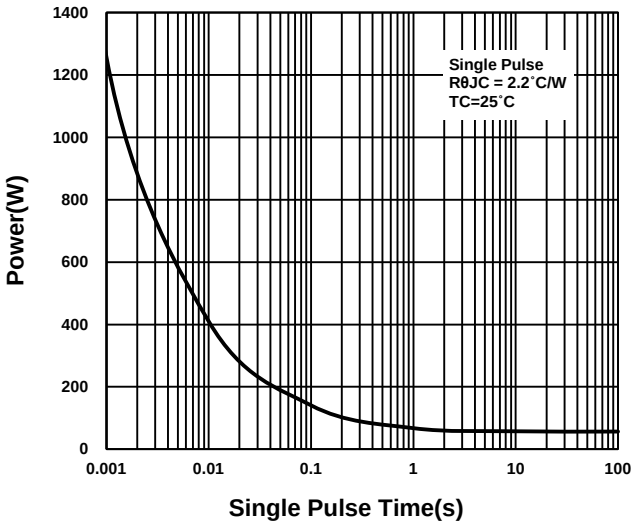
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve