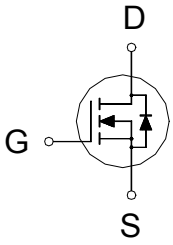
NIKO-SEM

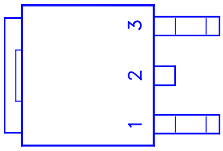
N-Channel Logic Level Enhancement Mode Field Effect Transistor

P6006BD
TO-252
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
60	60mΩ	21A





1.GATE
2.DRAIN
3.SOURCE

RoHS Compliant

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	T_C = 25 °C	I_D	21	A
	T_C = 70 °C		17	
Pulsed Drain Current[1]		I_{DM}	85	
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 70 °C		32	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		75	°C / W

[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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	μA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	21			A

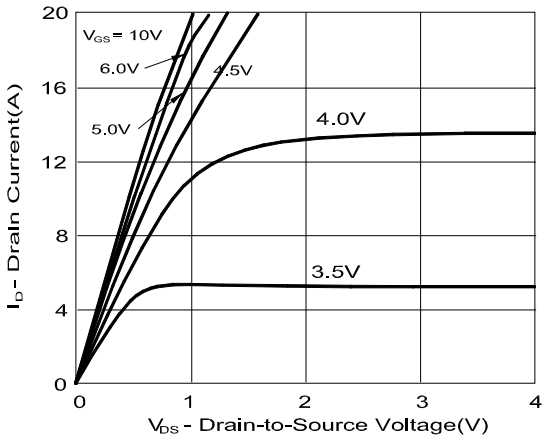
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 5V, I_D = 8A		60	80	mΩ
		V_{GS} = 10V, I_D = 12A		48	60	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 10A		12		S

DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		584		pF
Output Capacitance	C_{oss}			79		
Reverse Transfer Capacitance	C_{rss}			44		
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 10A		11.5		nC
Gate-Source Charge[2]	Q_{gs}			2.1		
Gate-Drain Charge[2]	Q_{gd}			2.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 30V, $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 6Ω		10		nS
Rise Time[2]	t_r			7.3		
Turn-Off Delay Time[2]	$t_{d(off)}$			17.5		
Fall Time[2]	t_f			5.5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				12	A
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.2	V

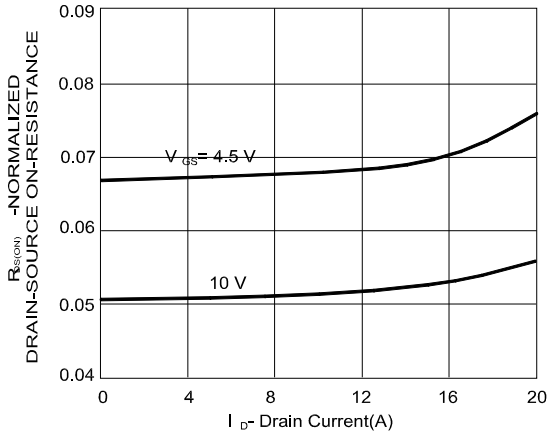
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

TYPICAL PERFORMANCE CHARACTERISTICS

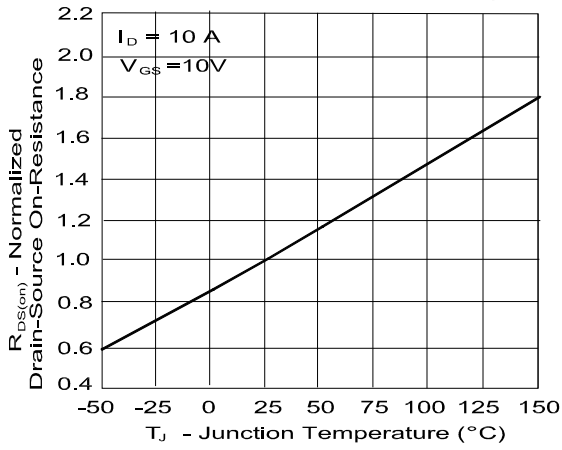
On-Region Characteristics



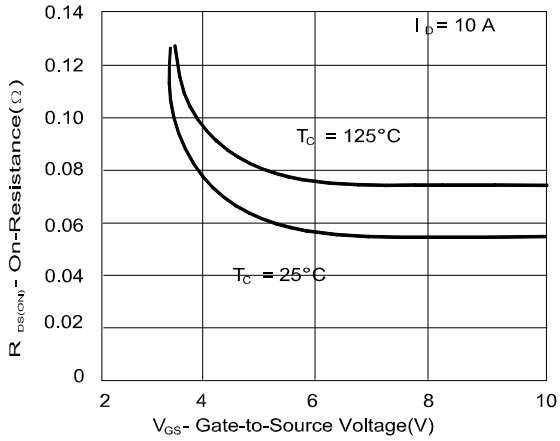
On-Resistance Variation with Drain Current and Gate Voltage



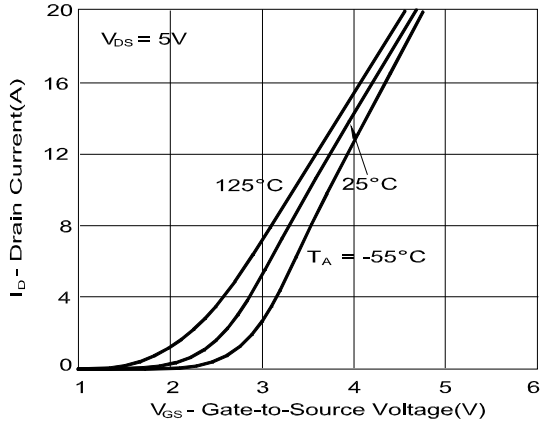
On-Resistance Variation with Temperature



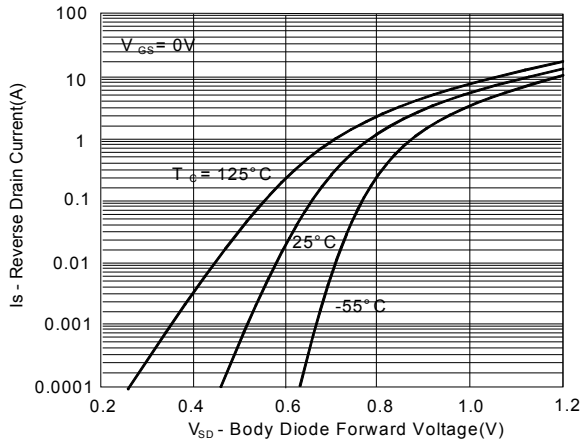
On-Resistance Variation with Gate-to-Source Voltage



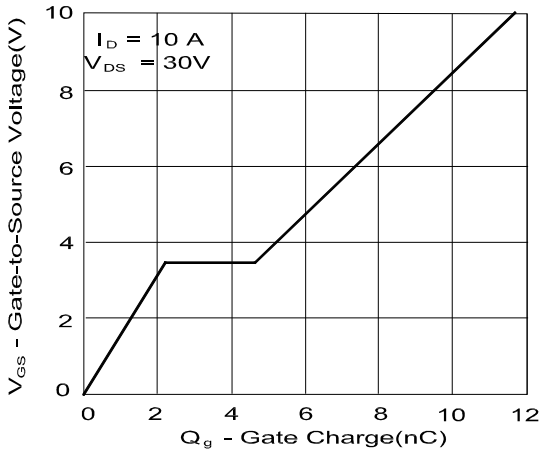
Transfer Characteristics



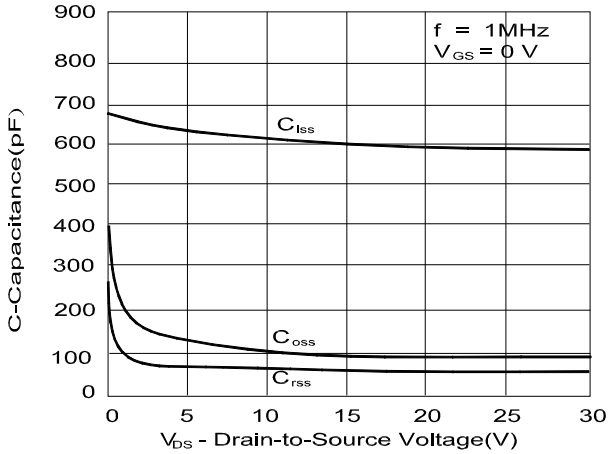
Body Diode Forward Voltage



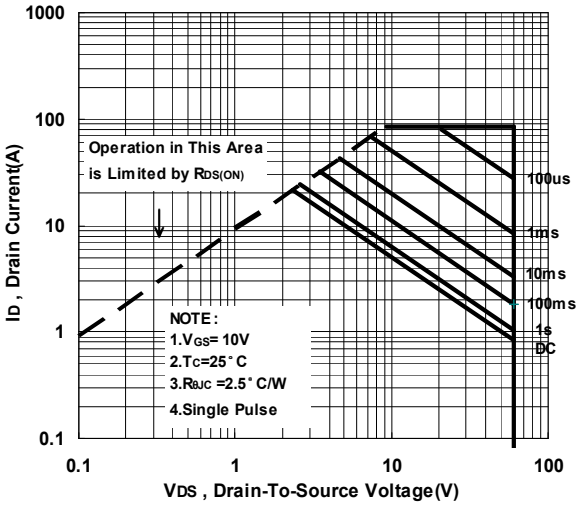
Gate Charge Characteristics



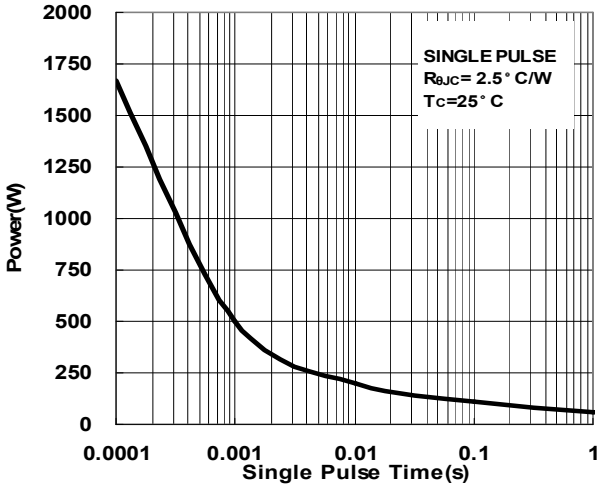
Capacitance Characteristics



Safe Operating Area



Single Pulse Maximum Power Disspation



Transient Thermal Response Curve