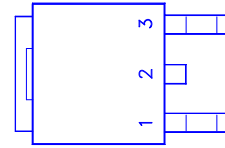
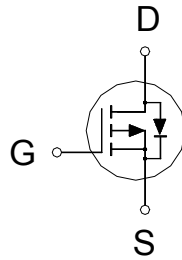


**NIKO-SEM** P-Channel Logic Level Enhancement Mode **P3506DD**  
 Field Effect Transistor **TO-252**  
 Halogen-Free & Lead-Free



**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-60V	35mΩ	-26A



1. GATE
2. DRAIN
3. SOURCE

**ABSOLUTE MAXIMUM RATINGS ( $T_c = 25\text{ }^\circ\text{C}$  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	$T_c = 25\text{ }^\circ\text{C}$	$I_D$	-26	A
	$T_c = 100\text{ }^\circ\text{C}$		-16	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	-100	
Avalanche Current		$I_{AS}$	-39	
Avalanche Energy <sup>2</sup>	L = 0.1mH	$E_{AS}$	77	mJ
Power Dissipation	$T_c = 25\text{ }^\circ\text{C}$	$P_D$	42	W
	$T_c = 100\text{ }^\circ\text{C}$		17	
Junction & Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	°C

**THERMAL RESISTANCE RATINGS**

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		50	°C / W

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup> $V_{DD} = -30V$ . Starting  $T_J = 25\text{ }^\circ\text{C}$ .

**ELECTRICAL CHARACTERISTICS ( $T_J = 25\text{ }^\circ\text{C}$ , Unless Otherwise Noted)**

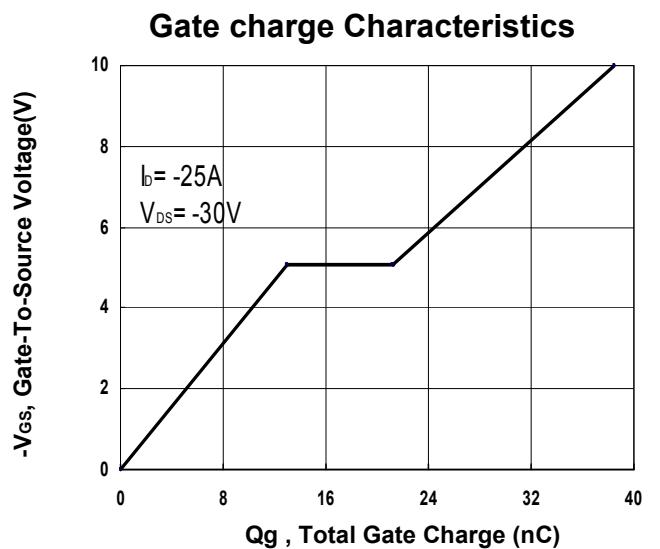
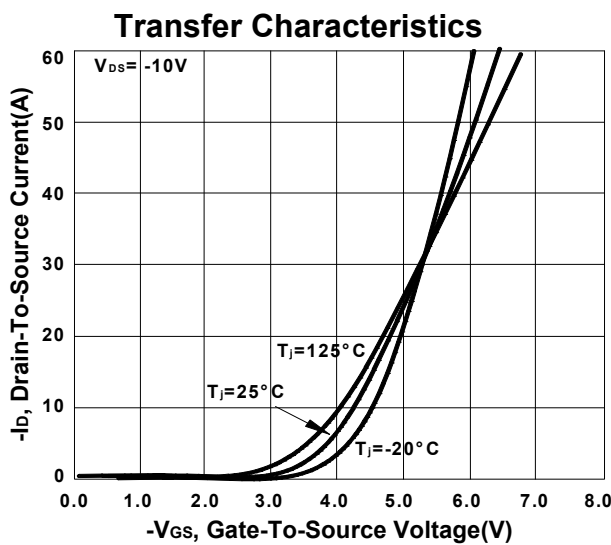
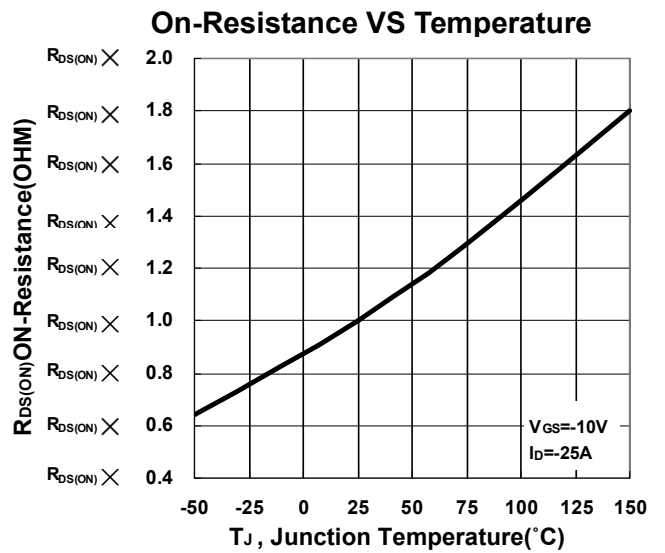
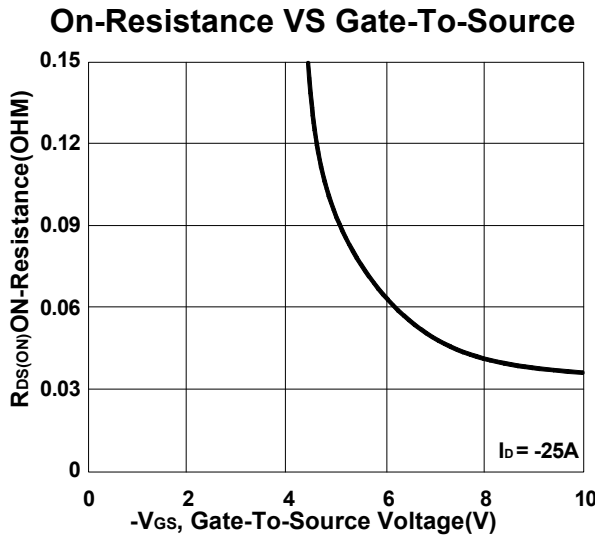
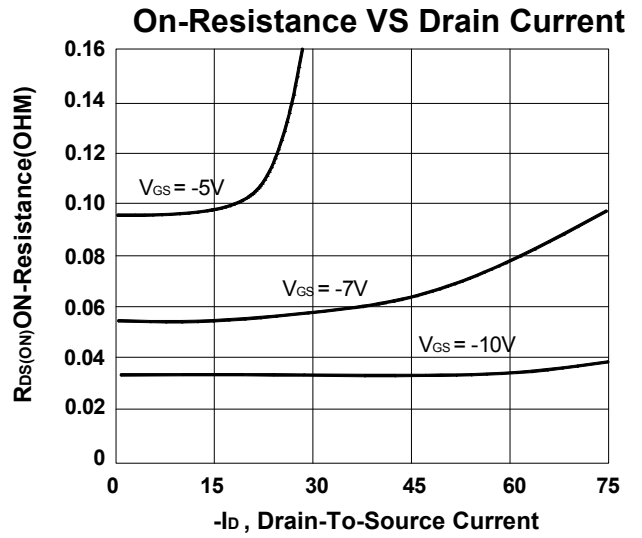
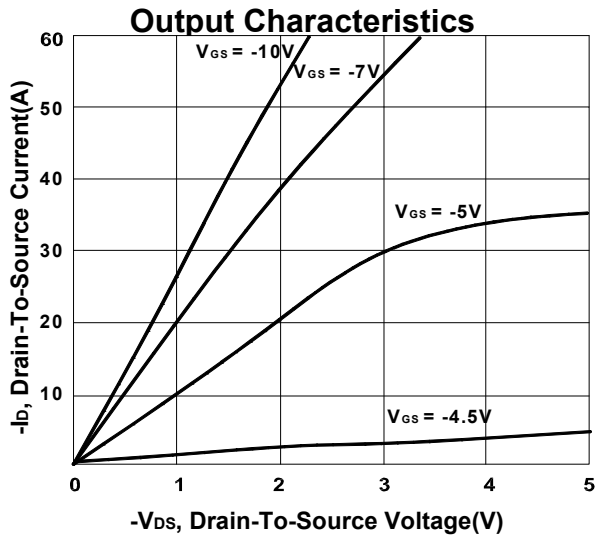
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	-2	-2.7	-4	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			±100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -48V, V_{GS} = 0V$			1	μA
		$V_{DS} = -40V, V_{GS} = 0V, T_J = 55\text{ }^\circ\text{C}$			10	
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = -7V, I_D = -20A$		32	55	mΩ
		$V_{GS} = -10V, I_D = -25A$		29	35	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = -5V, I_D = -25A$		15		S

**NIKO-SEM** P-Channel Logic Level Enhancement Mode **P3506DD**  
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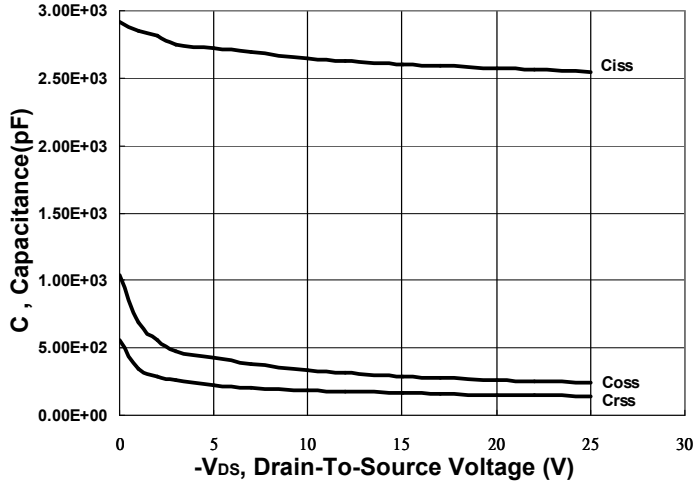
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = -5V, V_{GS} = -10V,$	-100			A
<b>DYNAMIC</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -30V, f = 1MHz$		2550		pF
Output Capacitance	$C_{oss}$			241		
Reverse Transfer Capacitance	$C_{rss}$			140		
Gate Resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		4.85		$\Omega$
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -25A$		39		nC
Gate-Source Charge <sup>2</sup>	$Q_{gs}$			13		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$			8		
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS} = -30V, R_L = 1\Omega$ $I_D \cong -20A, V_{GS} = -10V, R_{GEN} = 6\Omega$		30		nS
Rise Time <sup>2</sup>	$t_r$			90		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$			70		
Fall Time <sup>2</sup>	$t_f$			15		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_J = 25^\circ C</math>)</b>						
Continuous Current	$I_S$				-26	A
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = -25A, V_{GS} = 0V$			-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = -25A, di_F/dt = 100A / \mu S$		30		nS
Reverse Recovery Charge	$Q_{rr}$				100	

<sup>1</sup>Pulse test : Pulse Width  $\leq 300 \mu sec$ , Duty Cycle  $\leq 2\%$ .

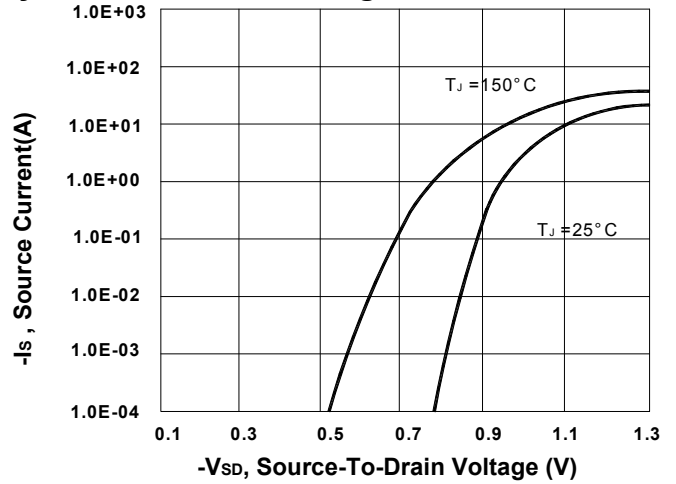
<sup>2</sup>Independent of operating temperature.



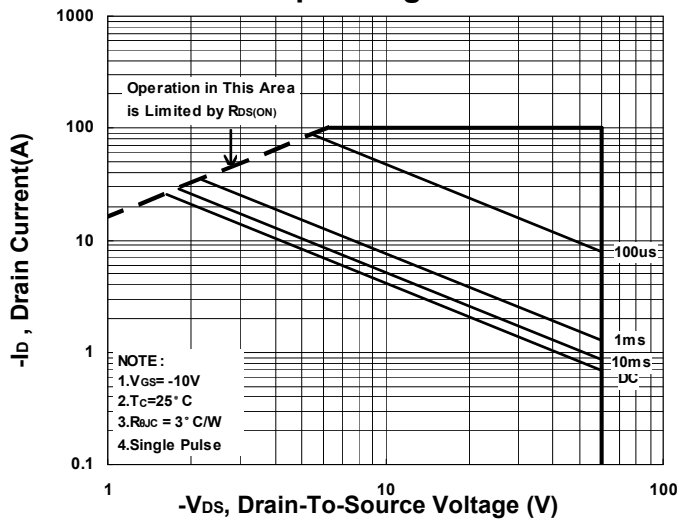
**Capacitance Characteristic**



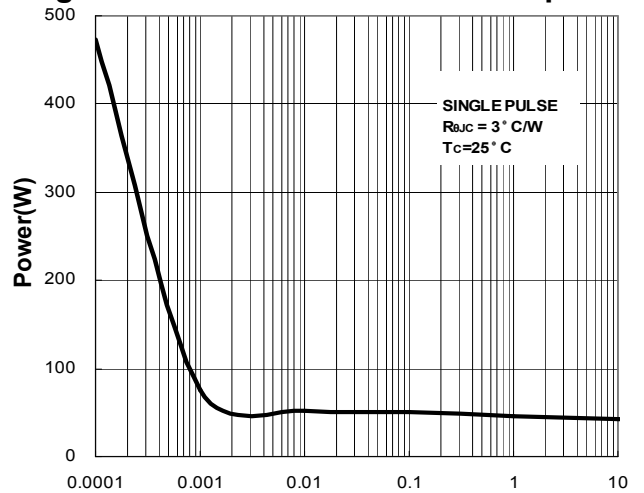
**Body Diode Forward Voltage VS Source current**



**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

