NIKO-SEM

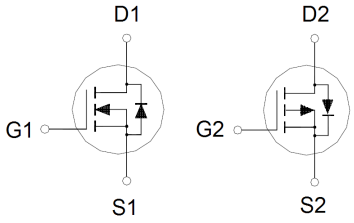
N- & P-Channel Enhancement Mode Field Effect Transistor

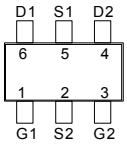
P6002OAG
TSOP-6
Halogen-Free & Lead-Free

RoHS Compliant

PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
N-Channel	20V	60mΩ	3.4A
P-Channel	-20V	115mΩ	-2.5A





G : GATE
D : DRAIN
S : SOURCE

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	N-Channel	P-Channel	UNITS
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	±12	±12	V
Continuous Drain Current	T_A = 25 °C	I_D	3.4	-2.5	A
	T_A = 70 °C		2.7	-2	
Pulsed Drain Current[1]		I_{DM}	15	-15	
Avalanche Current		I_{AS}	5.5	-12	
Avalanche Energy	L = 0.1mH	E_{AS}	1.5	7.4	mJ
Power Dissipation	T_A = 25 °C	P_D	1.14		W
	T_A = 70 °C		0.72		
Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	t ≤ 10s	$R_{\theta JA}$		110	°C / W
Junction-to-Ambient	Steady-State	$R_{\theta JA}$		150	
Junction-to-Lead	Steady-State	$R_{\theta JC}$		80	

[1]Pulse width limited by maximum junction temperature.

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	N-Ch	20			V
		V_{GS} = 0V, I_D = -250μA	P-Ch	-20			

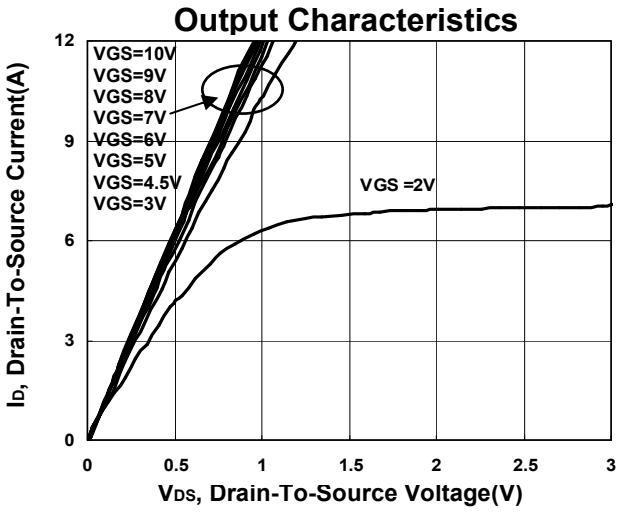
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	N-Ch	0.4	0.75	1.3	
		$V_{DS} = V_{GS}$, $I_D = -250\mu A$	P-Ch	-0.4	-0.75	-1.3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V$, $V_{GS} = \pm 12V$	N-Ch			±100	nA
		$V_{DS} = 0V$, $V_{GS} = \pm 12V$	P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16V$, $V_{GS} = 0V$	N-Ch			1	µA
		$V_{DS} = -16V$, $V_{GS} = 0V$	P-Ch			-1	
		$V_{DS} = 10V$, $V_{GS} = 0V$, $T_J = 55°C$	N-Ch			10	
		$V_{DS} = -10V$, $V_{GS} = 0V$, $T_J = 55°C$	P-Ch			-10	
On-State Drain Current[1]	$I_{D(ON)}$	$V_{DS} = 5V$, $V_{GS} = 10V$	N-Ch	15			A
		$V_{DS} = -5V$, $V_{GS} = -10V$	P-Ch	-15			
Drain-Source On-State resistance[1]	$R_{DS(ON)}$	$V_{GS} = 1.8V$, $I_D = 2A$	N-Ch		90	140	mΩ
		$V_{GS} = -1.8V$, $I_D = -1A$	P-Ch		171	300	
		$V_{GS} = 2.5V$, $I_D = 3A$	N-Ch		63	85	
		$V_{GS} = -2.5V$, $I_D = -2A$	P-Ch		118	180	
		$V_{GS} = 4.5V$, $I_D = 3.6A$	N-Ch		47	60	
		$V_{GS} = -4.5V$, $I_D = -3.1A$	P-Ch		85	115	
Forward Transconductance[1]	g_{fs}	$V_{DS} = 5V$, $I_D = 3.6A$	N-Ch		6		S
		$V_{DS} = -5V$, $I_D = -3.1A$	P-Ch		11		

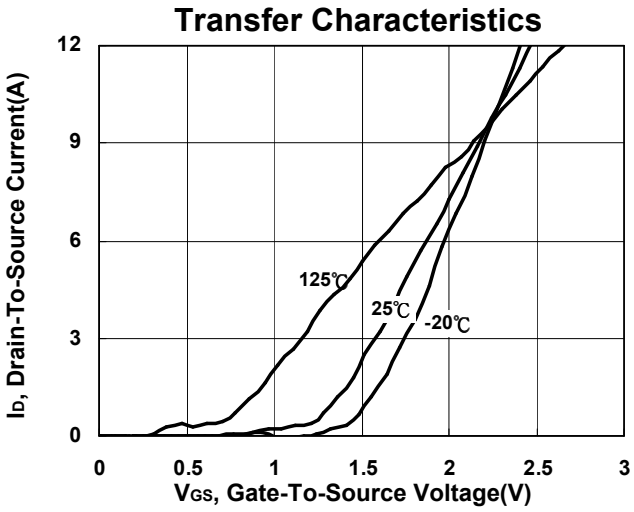
DYNAMIC							
Input Capacitance	C_{iss}	N-Channel $V_{GS} = 0V$, $V_{DS} = 15V$, $f = 1MHz$ P-Channel $V_{GS} = 0V$, $V_{DS} = -15V$, $f = 1MHz$	N-Ch		263		pF
			P-Ch		415		
Output Capacitance	C_{oss}		N-Ch		128		
			P-Ch		126		
Reverse Transfer Capacitance	C_{rss}		N-Ch		87		
			P-Ch		78		
Gate Resistance	Rg	$V_{GS} = 0V$, $V_{DS} = 0V$, $f = 1MHz$	N-Ch		1.65		Ω
			P-Ch		6.1		

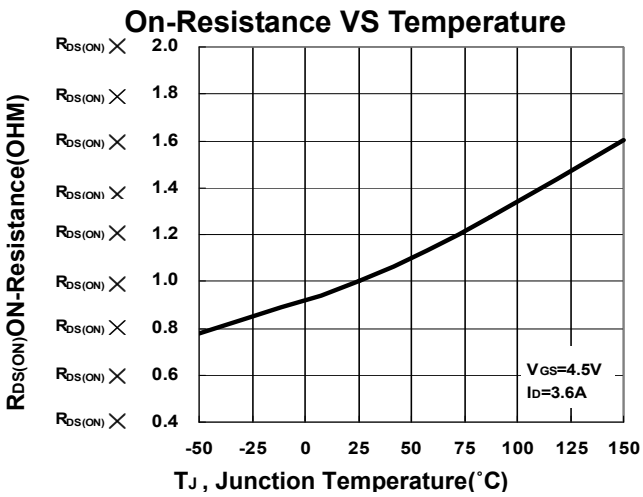
Total Gate Charge[2]	Q_g	N-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 4.5V I_D = 3.6A P-Channel V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 4.5V I_D = -3.1A	N-Ch P-Ch		4 4		nC
Gate-Source Charge[2]	Q_{gs}		N-Ch P-Ch		0.5 1		
Gate-Drain Charge[2]	Q_{gd}		N-Ch P-Ch		1.6 1.1		
Turn-On Delay Time[2]	$t_{d(on)}$	N-Channel V_{DS} = 15V $I_D \cong$ 3.6A, V_{GS} = 10V, R_{GEN} = 6Ω P-Channel V_{DS} = -15V, R_L = 1Ω $I_D \cong$ -3.1A, V_{GS} = -10V, R_{GEN} = 6Ω	N-Ch P-Ch		6 10		nS
Rise Time[2]	t_r		N-Ch P-Ch		7 12		
Turn-Off Delay Time[2]	$t_{d(off)}$		N-Ch P-Ch		40 44		
Fall Time[2]	t_f		N-Ch P-Ch		13 22		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)							
Continuous Current	I_S		N-Ch P-Ch			0.95 -0.95	A
Forward Voltage[1]	V_{SD}	I_F = 3.6A, V_{GS} = 0V I_F = -3.1A, V_{GS} = 0V	N-Ch P-Ch			1.2 -1.2	V
Reverse Recovery Time	t_{rr}	I_F = 3.6A, dI_F/dt = 100A / µS I_F = -3.1A, dI_F/dt = 100A / µS	N-Ch P-Ch		14 25		nS
Reverse Recovery Charge	Q_{rr}		N-Ch P-Ch		4 8		nC

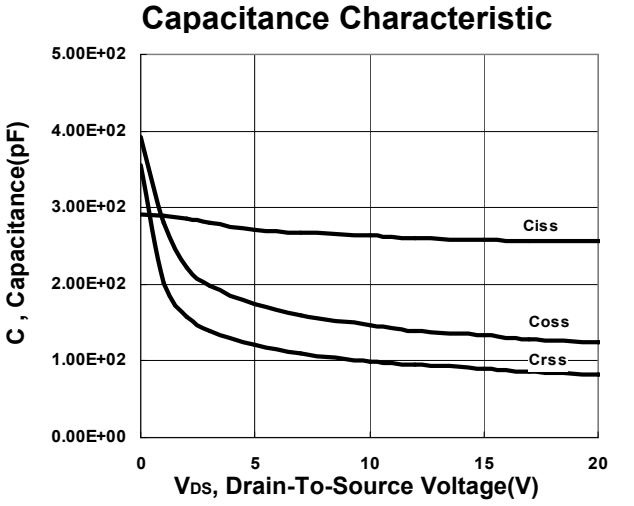
[1]Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

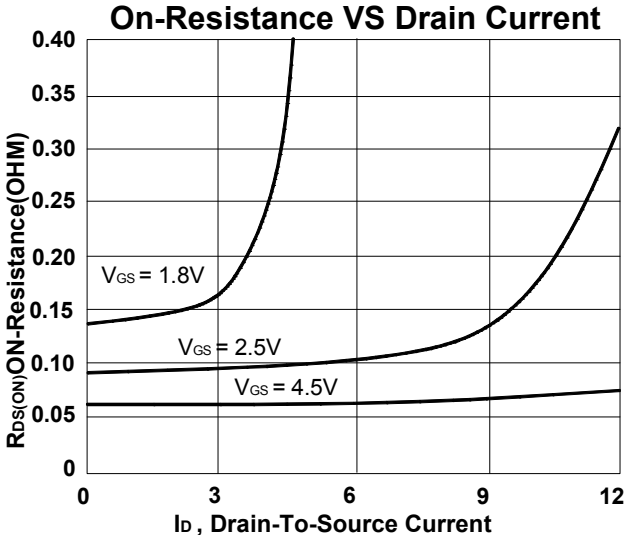
TYPICAL PERFORMANCE CHARACTERISTICS
N-CHANNEL

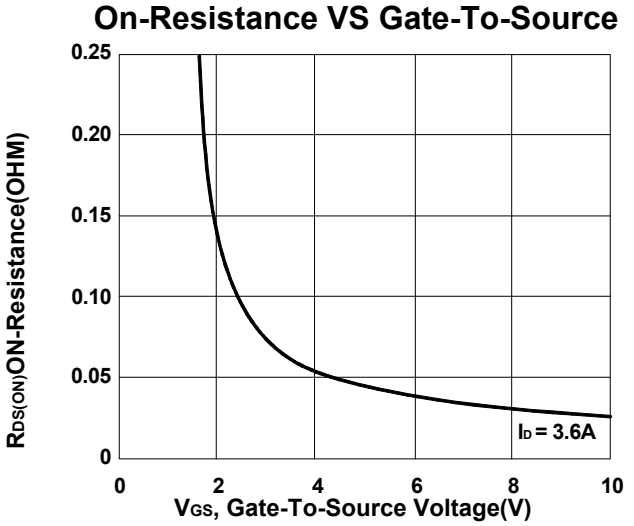




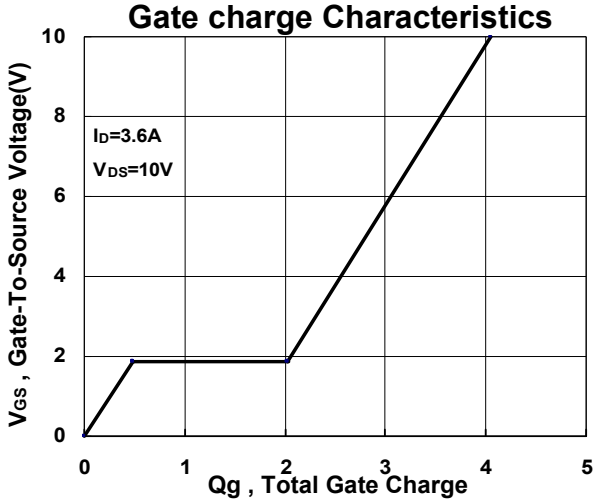




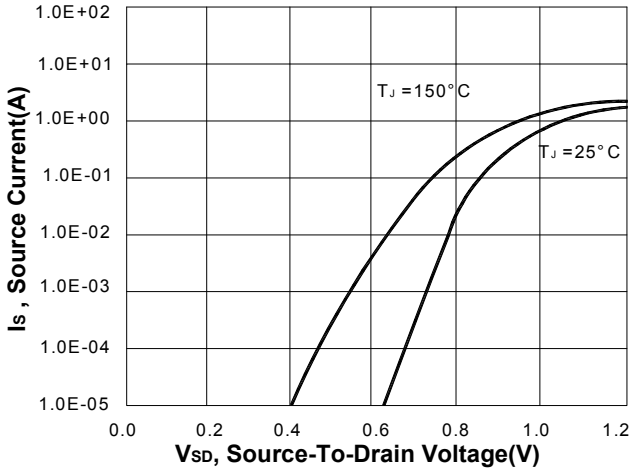




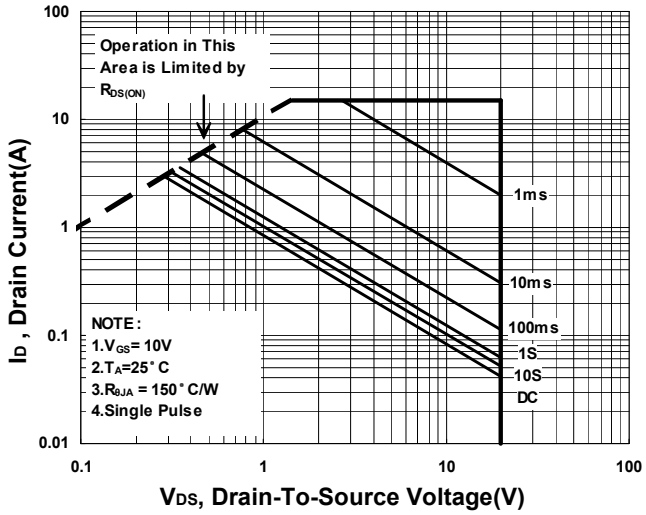
Gate charge Characteristics



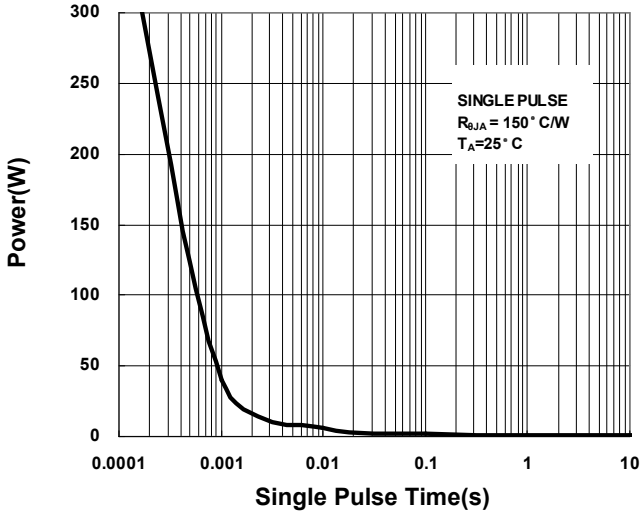
Source-Drain Diode Forward Voltage



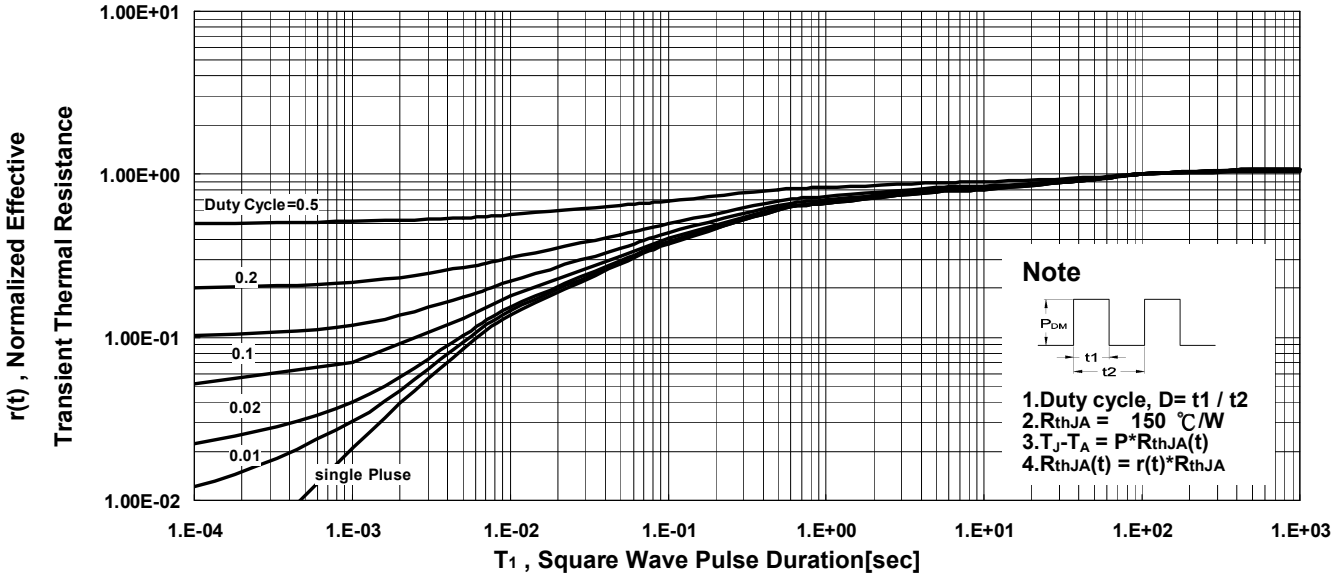
Safe Operating Area



Single Pulse Maximum Power Dissipation

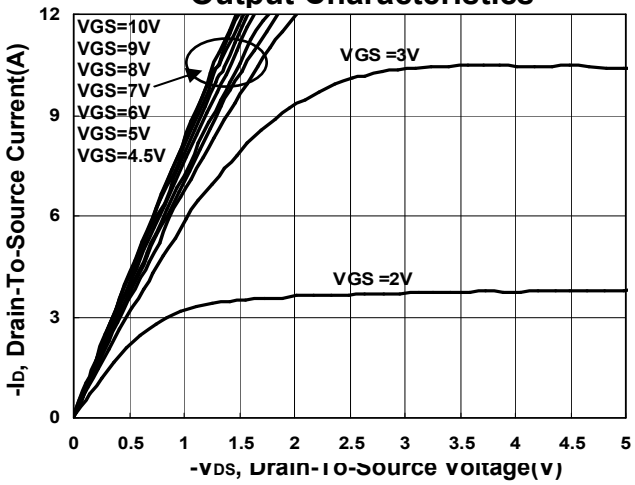


Transient Thermal Response Curve

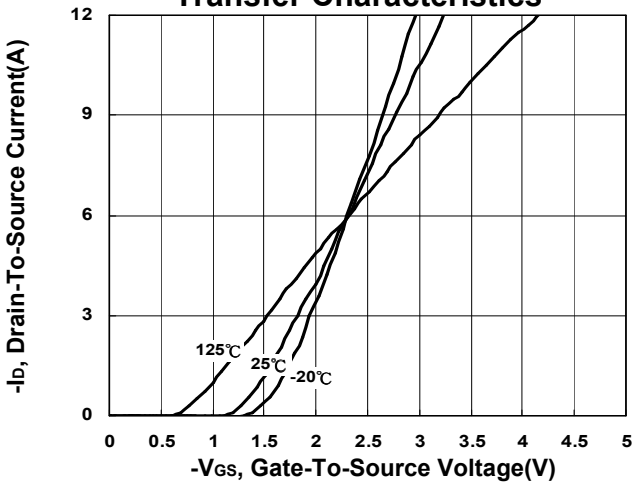


TYPICAL PERFORMANCE CHARACTERISTICS
P-CHANNEL

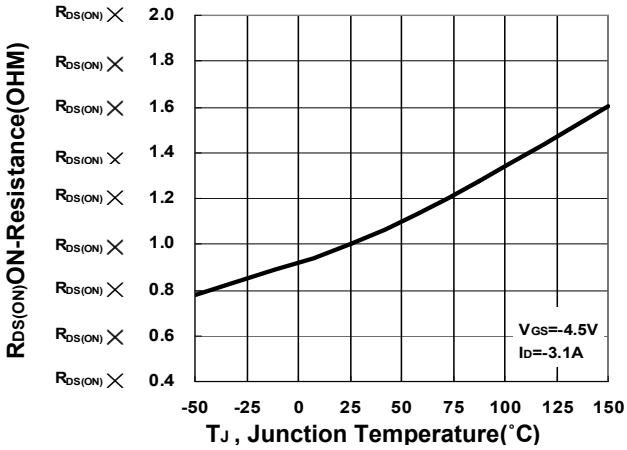
Output Characteristics



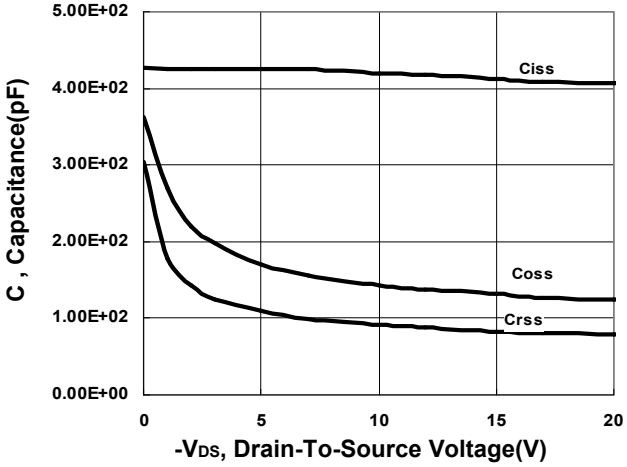
Transfer Characteristics



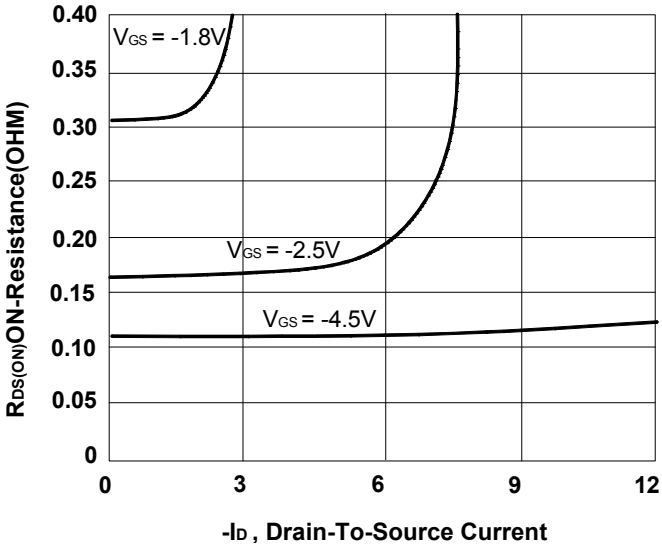
On-Resistance VS Temperature



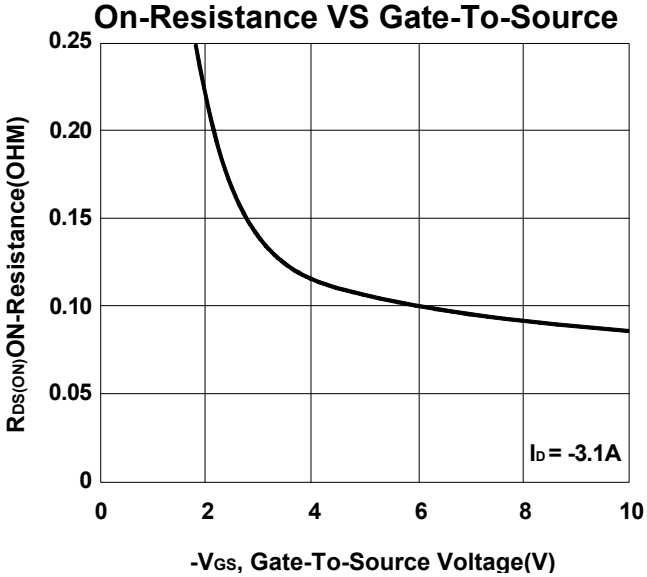
Capacitance Characteristic



On-Resistance VS Drain Current



On-Resistance VS Gate-To-Source



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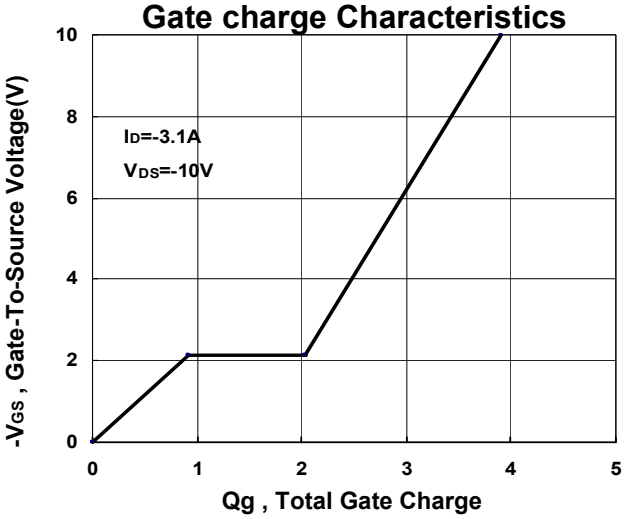

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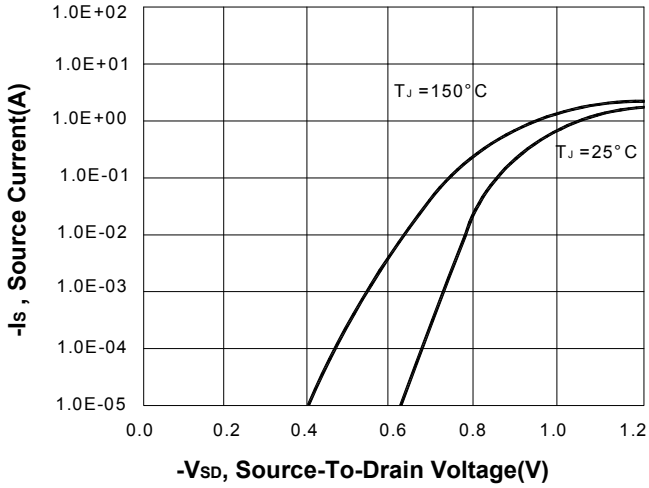

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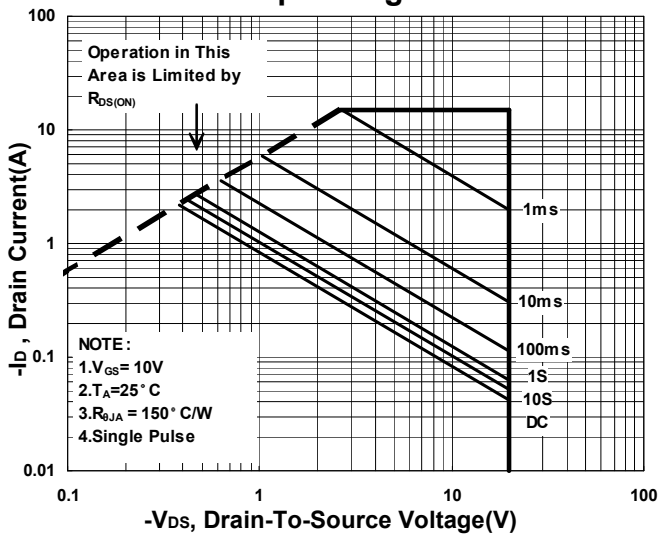

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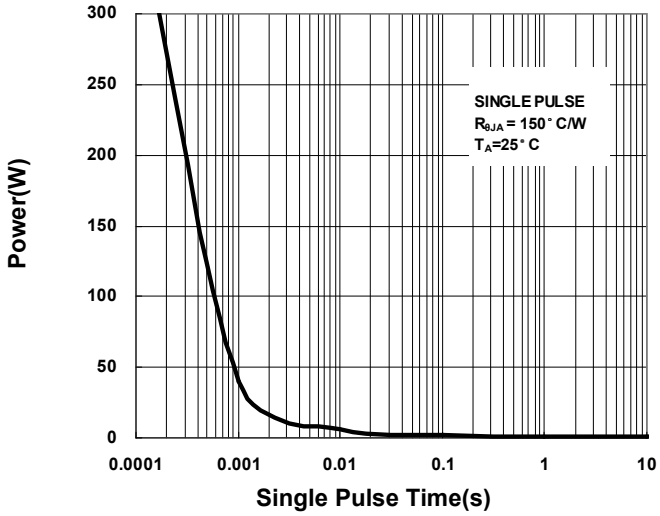

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