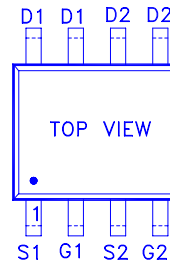
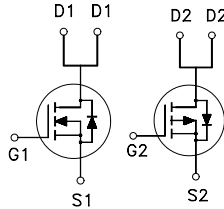


**PRODUCT SUMMARY**

	$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
N-Channel	30	21mΩ	7A
P-Channel	-30	35mΩ	-6A



G : GATE  
D : DRAIN  
S : SOURCE

**ABSOLUTE MAXIMUM RATINGS ( $T_C = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)**

PARAMETERS/TEST CONDITIONS		SYMBOL	N-Channel	P-Channel	UNITS
Drain-Source Voltage		$V_{DS}$	30	-30	V
Gate-Source Voltage		$V_{GS}$	±20	±20	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	7	-6	A
	$T_C = 70\text{ }^\circ\text{C}$		6	-5	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	28	-24	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	2		W
	$T_C = 70\text{ }^\circ\text{C}$		1.3		
Junction & Storage Temperature Range		$T_j, T_{stg}$	-55 to 150		°C
Lead Temperature ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.)		$T_L$	275		

**THERMAL RESISTANCE RATINGS**

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

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

<sup>2</sup>Duty cycle ≤ 1%

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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	N-Ch	30		V
		$V_{GS} = 0V, I_D = -250\mu A$	P-Ch	-30		
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	N-Ch	0.8	1.5	2.5
		$V_{DS} = V_{GS}, I_D = -250\mu A$	P-Ch	-0.8	-1.5	-2.5

Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	N-Ch			$\pm 100$	nA
		$V_{DS} = 0V, V_{GS} = \pm 20V$	P-Ch			$\pm 100$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24V, V_{GS} = 0V$	N-Ch			1	$\mu A$
		$V_{DS} = -24V, V_{GS} = 0V$	P-Ch			-1	
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 55^\circ C$	N-Ch			10	
		$V_{DS} = -20V, V_{GS} = 0V, T_J = 55^\circ C$	P-Ch			-10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	N-Ch	28			A
		$V_{DS} = -5V, V_{GS} = -10V$	P-Ch	-24			
Drain-Source Resistance <sup>1</sup>	On-State $R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 6A$	N-Ch		21	32	m $\Omega$
		$V_{GS} = -4.5V, I_D = -5A$	P-Ch		44	60	
		$V_{GS} = 10V, I_D = 7A$	N-Ch		14	21	
		$V_{GS} = -10V, I_D = -6A$	P-Ch		28	35	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 10V, I_D = 5A$	N-Ch		8		S
		$V_{DS} = -10V, I_D = -5A$	P-Ch		7		

**DYNAMIC**

Input Capacitance	$C_{iss}$	N-Channel	N-Ch		1700		pF
			P-Ch		970		
Output Capacitance	$C_{oss}$	$V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	N-Ch		380		pF
			P-Ch		370		
Reverse Transfer Capacitance	$C_{rss}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	N-Ch		260		pF
			P-Ch		180		
Total Gate Charge <sup>2</sup>	$Q_g$	N-Channel	N-Ch		40		nC
			P-Ch		28		
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 6A$	N-Ch		28		nC
			P-Ch		6		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -5A$	N-Ch		12		nC
			P-Ch		12		

Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel	N-Ch	20	nS
			P-Ch	20	
Rise Time <sup>2</sup>	$t_r$	$V_{DS} = 15V$ $I_D \cong 1A, V_{GS} = 10V, R_{GEN} = 6\Omega$	N-Ch	10	
			P-Ch	17	
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$	P-Channel	N-Ch	120	
			P-Ch	160	
Fall Time <sup>2</sup>	$t_f$	$V_{DS} = -15V, R_L = 1\Omega$ $I_D \cong -1A, V_{GS} = -10V, R_{GEN} = 6\Omega$	N-Ch	35	
			P-Ch	75	

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>c</sub> = 25 °C)**

Continuous Current	$I_S$		N-Ch	3	A
			P-Ch	-3	
Pulsed Current <sup>3</sup>	$I_{SM}$		N-Ch	6	A
			P-Ch	-6	
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 1A, V_{GS} = 0V$	N-Ch	1	V
		$I_F = -1A, V_{GS} = 0V$	P-Ch	-1	
Reverse Recovery Time	$t_{rr}$	$I_F = 5A, di_F/dt = 100A / \mu S$	N-Ch	15.5	nS
		$I_F = -5A, di_F/dt = 100A / \mu S$	P-Ch	15.5	
Reverse Recovery Charge	$Q_{rr}$		N-Ch	7.9	nC
			P-Ch	7.9	

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

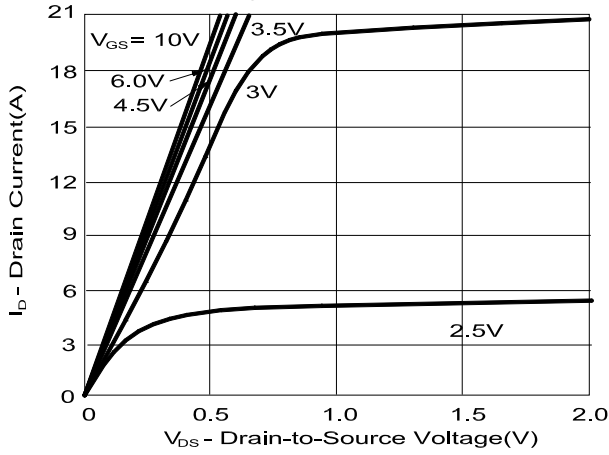
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Pulse width limited by maximum junction temperature.

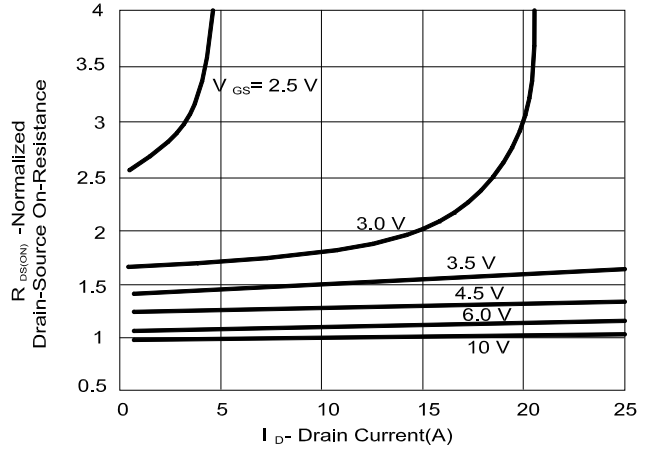
**REMARK: THE PRODUCT MARKED WITH "P2103NV", DATE CODE or LOT #**

**N-CHANNEL**

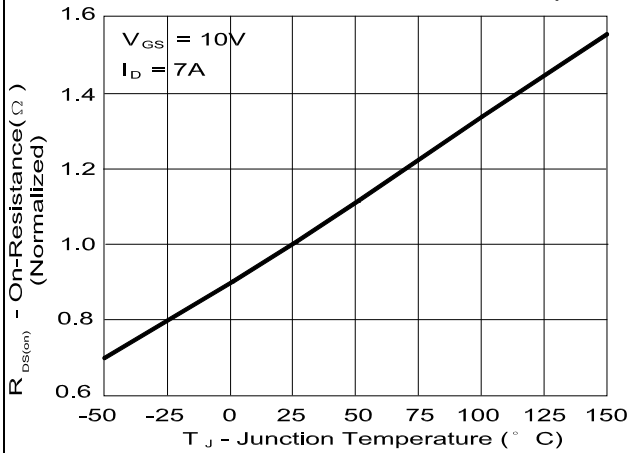
On-Region Characteristics



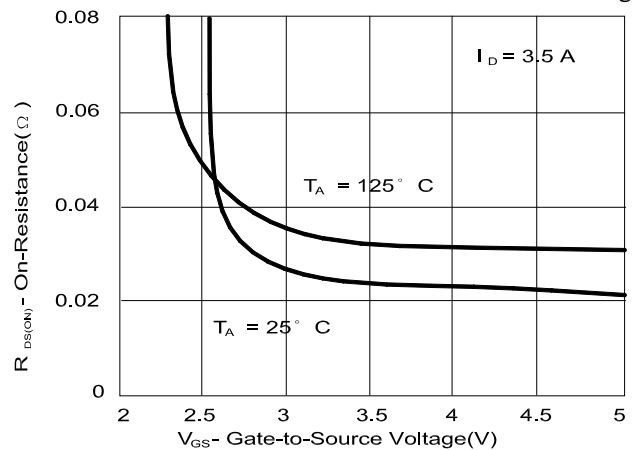
On-Resistance Variation with Drain Current and Gate Voltage



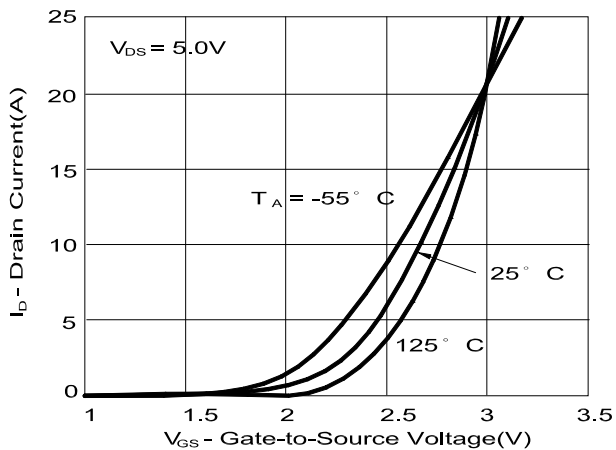
On-Resistance Variation with Temperature



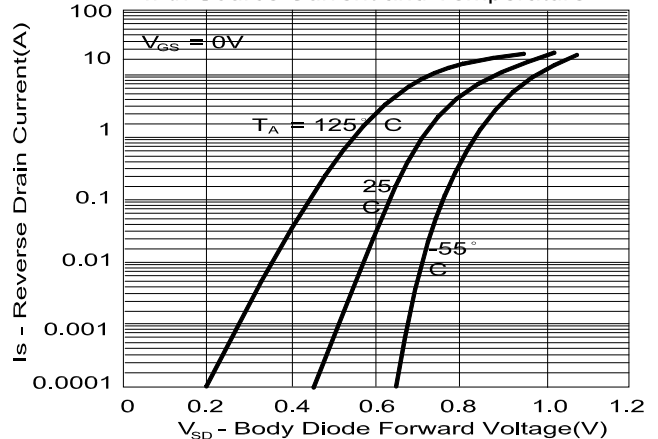
On-Resistance Variation with Gate-to-Source Voltage

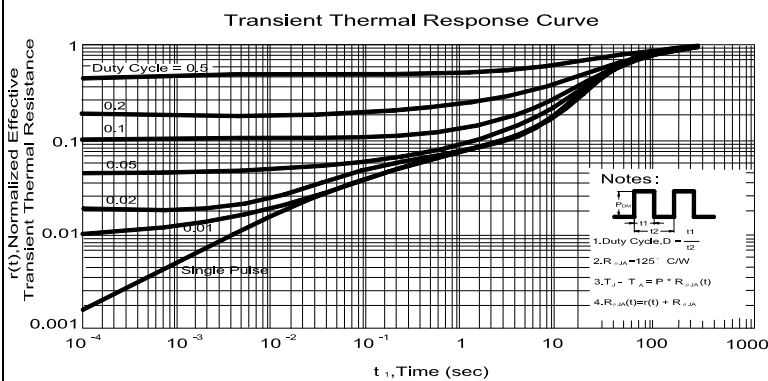
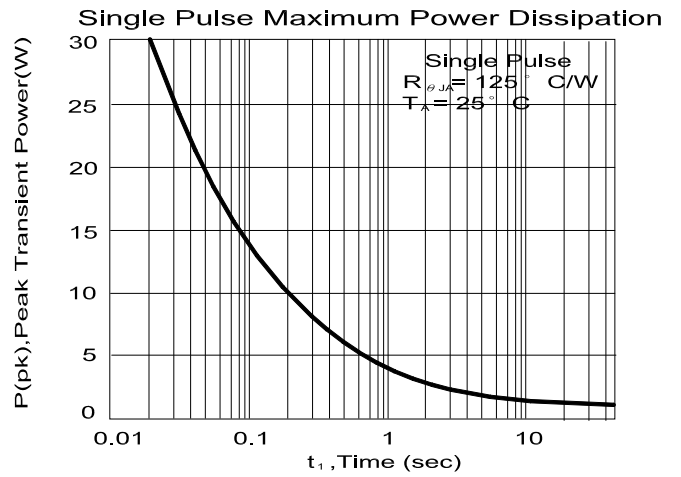
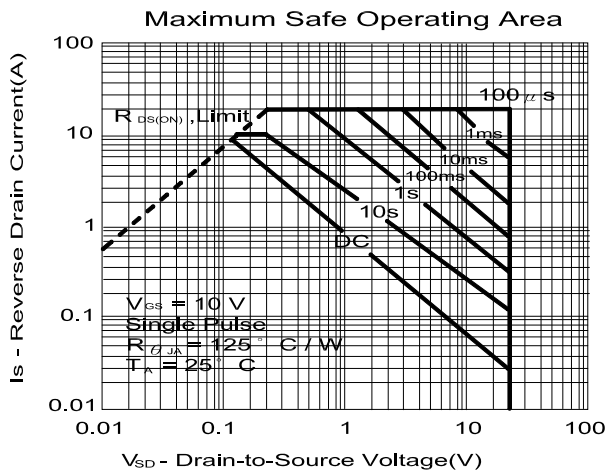
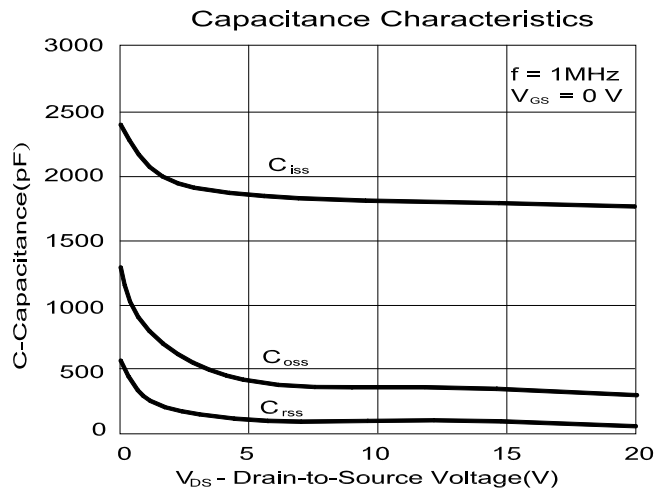
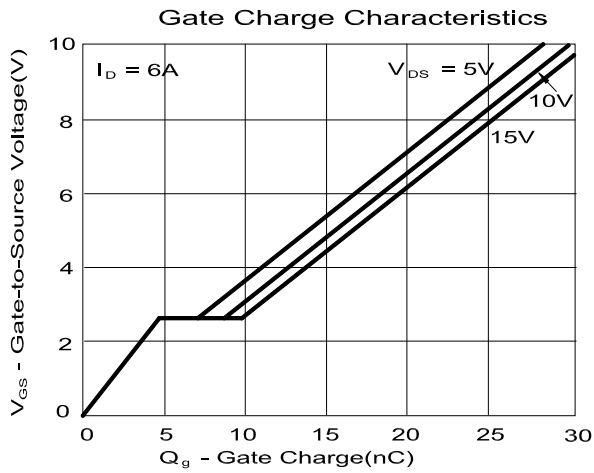


Transfer Characteristics



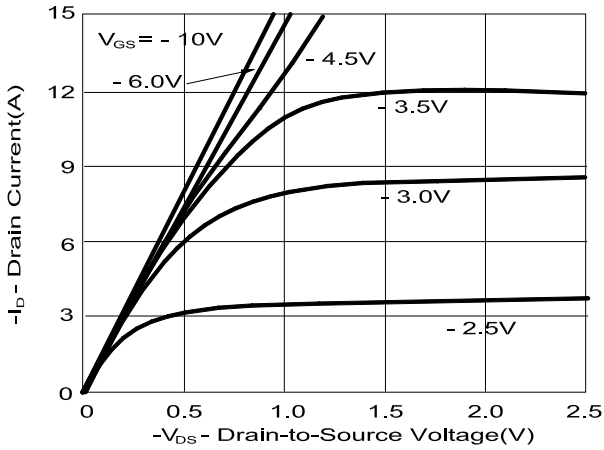
Body Diode Forward Voltage Variation with Source Current and Temperature



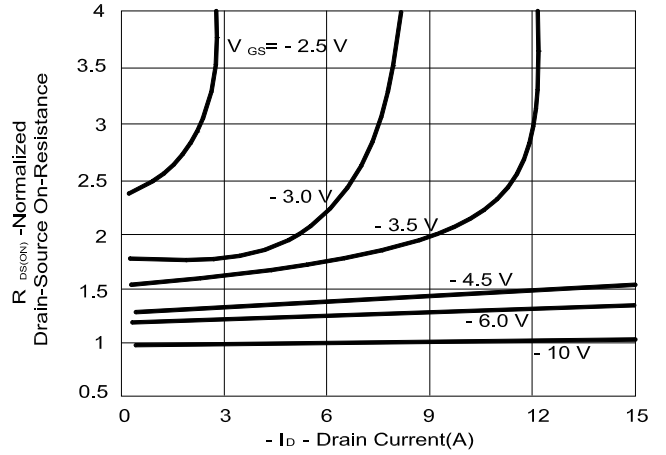


**P-CHANNEL**

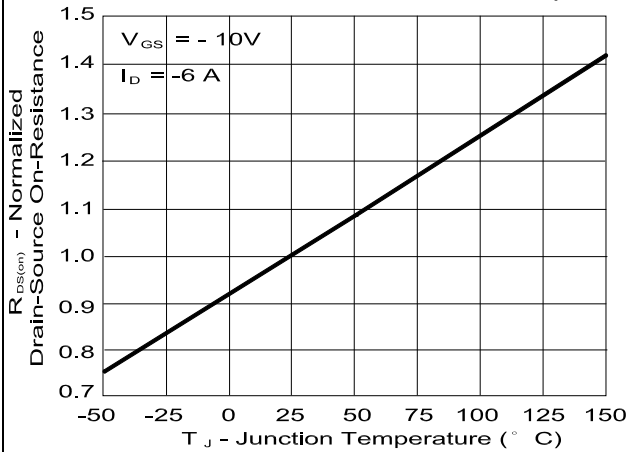
On-Region Characteristics



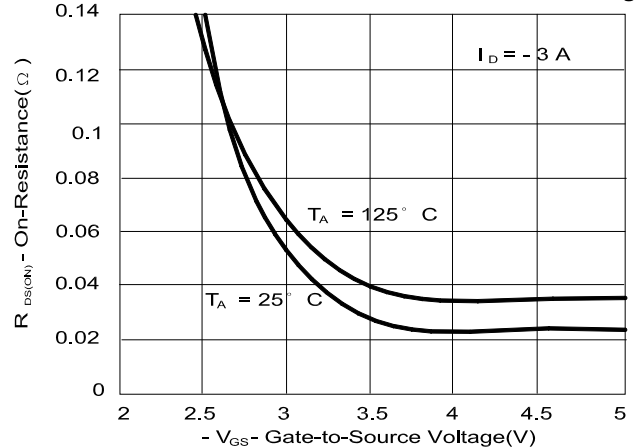
On-Resistance Variation with Drain Current and Gate Voltage



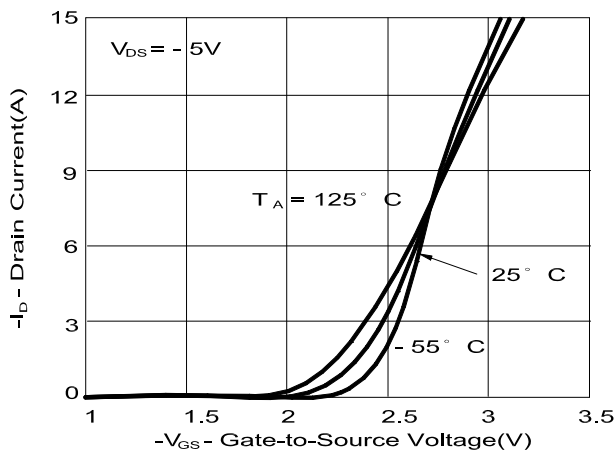
On-Resistance Variation with Temperature



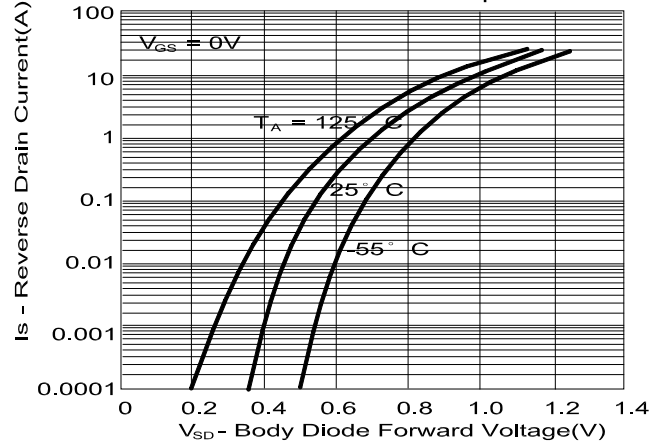
On-Resistance Variation with Gate-to-Source Voltage



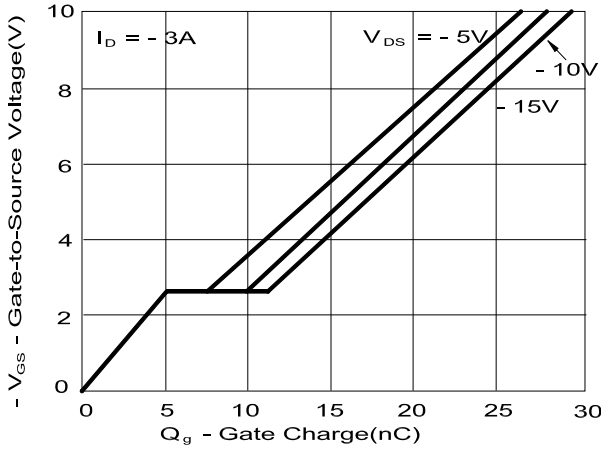
Transfer Characteristics



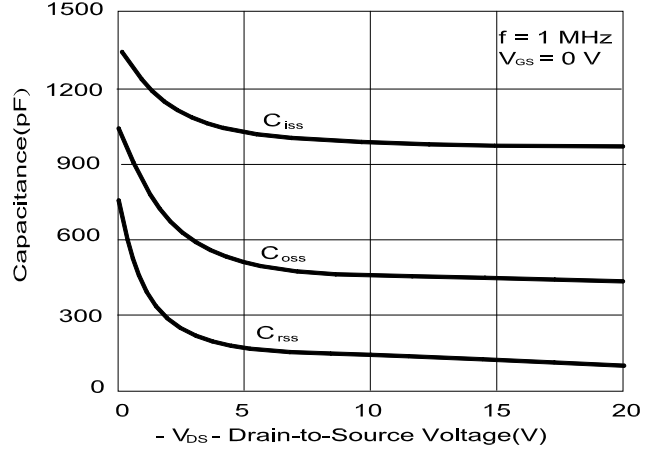
Body Diode Forward Voltage Variation with Source Current and Temperature



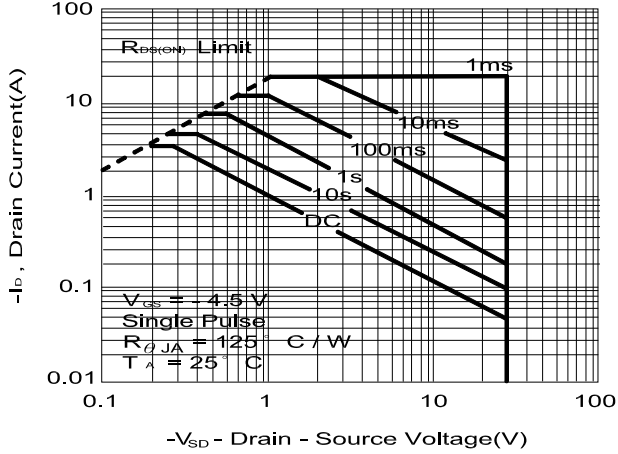
**Gate Charge Characteristics**



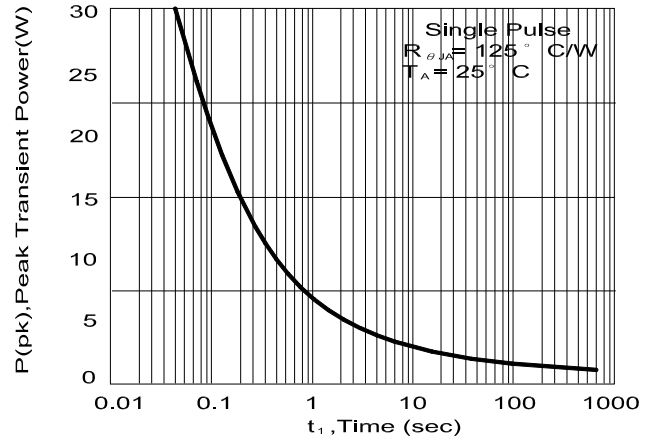
**Capacitance Characteristics**



**Maximum Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**SOIC-8 (D) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8	4.9	5.0	H	0.5	0.715	0.83
B	3.8	3.9	4.0	I	0.18	0.254	0.25
C	5.8	6.0	6.2	J		0.22	
D	0.38	0.445	0.51	K	0°	4°	8°
E		1.27		L			
F	1.35	1.55	1.75	M			
G	0.1	0.175	0.25	N			

