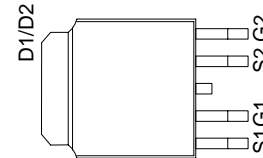
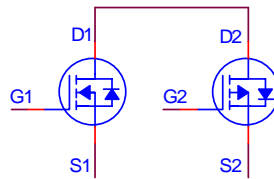


**PRODUCT SUMMARY**

	$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
N-Channel	40	28m	7A
P-Channel	-40	55m	-5.5A



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		$V_{DS}$	40	-40	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	7	-5.5	A
	$T_C = 70\text{ }^\circ\text{C}$		6	-4.5	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	50	-50	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	3		W
	$T_C = 70\text{ }^\circ\text{C}$		2.1		
Junction & Storage Temperature Range		$T_j, T_{stg}$	-55 to 150		$^\circ\text{C}$
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-Case	$R_{\theta JC}$		6	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		42	$^\circ\text{C} / \text{W}$

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

<sup>2</sup>Duty cycle  $\leq 1\%$

**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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	N-Ch	40		V
		$V_{GS} = 0V, I_D = -250\mu\text{A}$	P-Ch	-40		
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	N-Ch	1.0	1.5	2.5
		$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	P-Ch	-1.0	-1.5	-2.5
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	N-Ch			$\pm 100$
		$V_{DS} = 0V, V_{GS} = \pm 20V$	P-Ch			$\pm 100$

Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 32V, V_{GS} = 0V$	N-Ch			1	$\mu A$
		$V_{DS} = -32V, V_{GS} = 0V$	P-Ch			-1	
		$V_{DS} = 30V, V_{GS} = 0V, T_J = 55^\circ C$	N-Ch			10	
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 55^\circ C$	P-Ch			-10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	N-Ch	50			A
		$V_{DS} = -5V, V_{GS} = -10V$	P-Ch	-50			
Drain-Source Resistance <sup>1</sup>	On-State $R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 6A$	N-Ch		30	42	m
		$V_{GS} = -4.5V, I_D = -4.5A$	P-Ch		65	94	
		$V_{GS} = 10V, I_D = 7A$	N-Ch		21	28	
		$V_{GS} = -10V, I_D = -5.5A$	P-Ch		38	55	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 10V, I_D = 7A$	N-Ch		19		S
		$V_{DS} = -10V, I_D = -5.5A$	P-Ch		11		

**DYNAMIC**

Input Capacitance	$C_{iss}$		N-Ch		790	988	$\mu F$
		N-Channel	P-Ch		690	863	
Output Capacitance	$C_{oss}$	$V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	N-Ch		175	245	pF
			P-Channel	P-Ch		310	
Reverse Transfer Capacitance	$C_{rss}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	N-Ch		65	98	
			P-Channel	P-Ch		75	
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 7A$	N-Ch		16		nC
			P-Channel	P-Ch		14	
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -5.5A$	N-Ch		2.5		
			P-Channel	P-Ch		2.2	
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -5.5A$	N-Ch		2.1		
			P-Channel	P-Ch		1.9	

Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel	N-Ch		2.2	4.4	nS
			P-Ch		6.7	13.4	
Rise Time <sup>2</sup>	$t_r$	$V_{DS} = 20V$	N-Ch		7.5	15	
		$I_D \cong 1A, V_{GS} = 10V, R_{GEN} = 6$	P-Ch		9.7	19.4	
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$	P-Channel	N-Ch		11.8	21.3	
			P-Ch		19.8	35.6	
Fall Time <sup>2</sup>	$t_f$	$V_{DS} = -20V$	N-Ch		3.7	7.4	
		$I_D \cong -1A, V_{GS} = -10V, R_{GEN} = 6$	P-Ch		12.3	22.2	

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

Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 7A, V_{GS} = 0V$	N-Ch			1.2	V
		$I_F = -5.5A, V_{GS} = 0V$	P-Ch			-1.2	
Reverse Recovery Time	$t_{rr}$	$I_F = 8A, di_F/dt = 100A / \mu S$	N-Ch		42		nS
		$I_F = -7A, di_F/dt = 100A / \mu S$	P-Ch		55		
Reverse Recovery Charge	$Q_{rr}$		N-Ch		30		nC
			P-Ch		52		

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

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

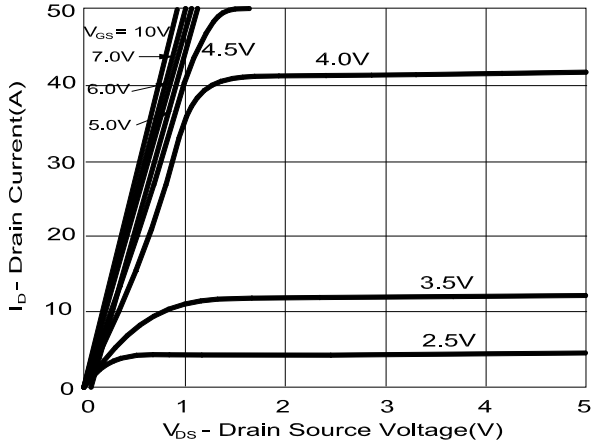
<sup>3</sup>Pulse width limited by maximum junction temperature.

**REMARK: THE PRODUCT MARKED WITH "P2804ND5G", DATE CODE or LOT #**

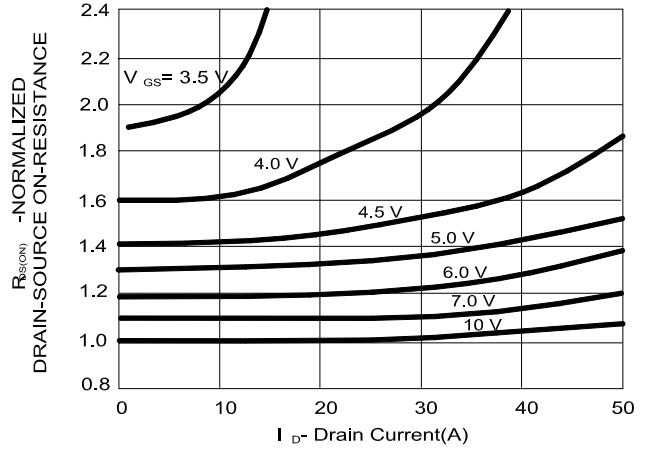
**Orders for parts with Lead-Free plating can be placed using the PXXXXXXG parts name.**

**N-CHANNEL**

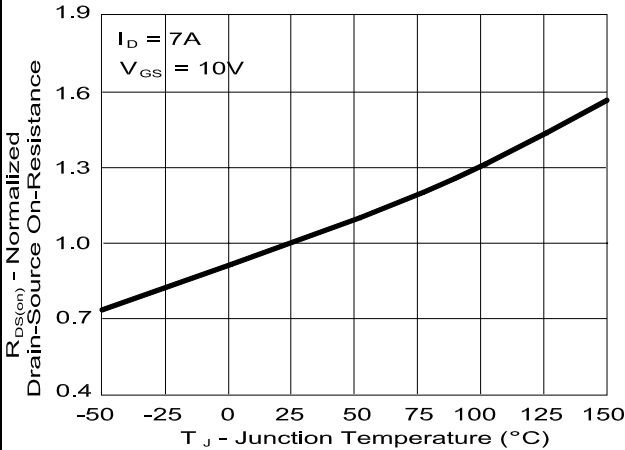
**On-Region Characteristics**



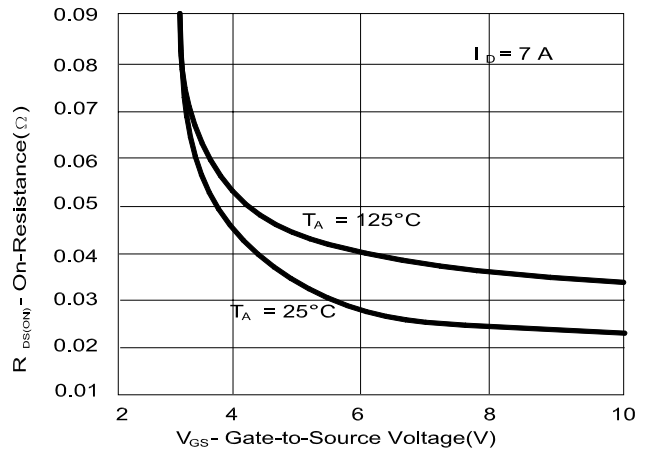
**On-Resistance Variation with Drain Current and Gate Voltage**



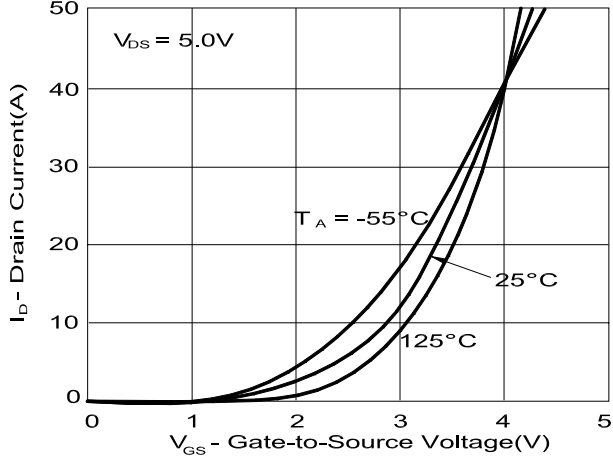
**On-Resistance Variation with Temperature**



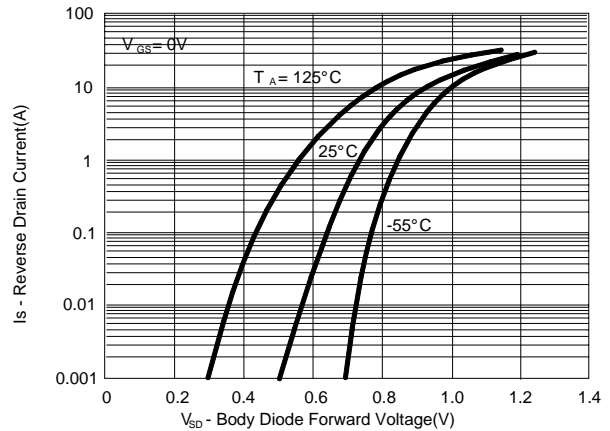
**On-Resistance Variation with Gate-to-Source Voltage**

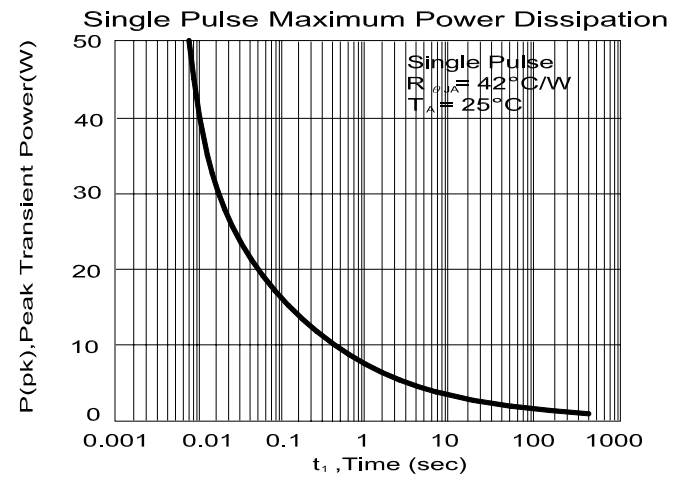
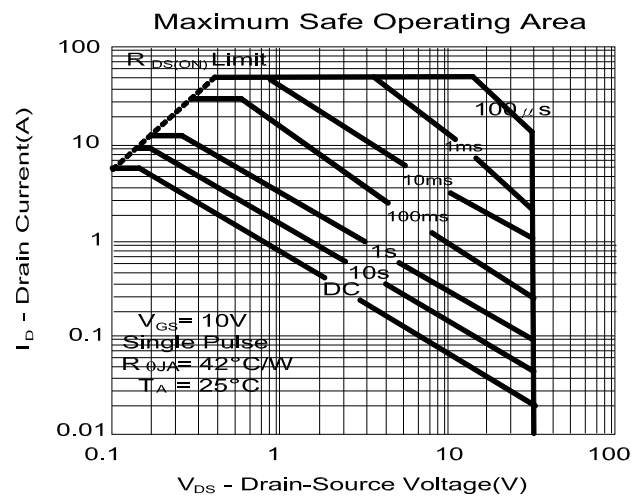
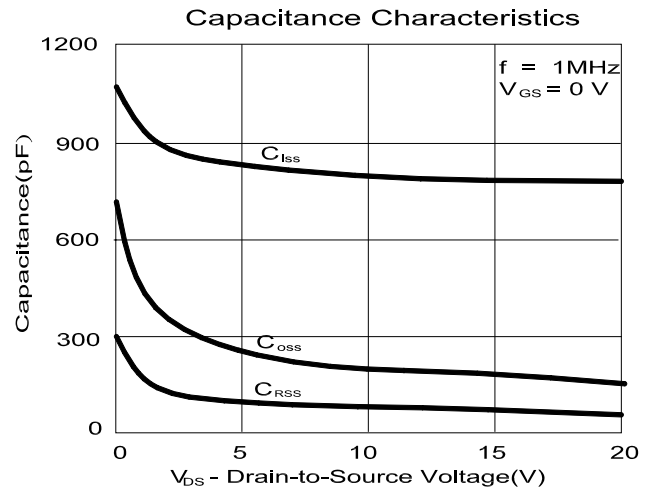
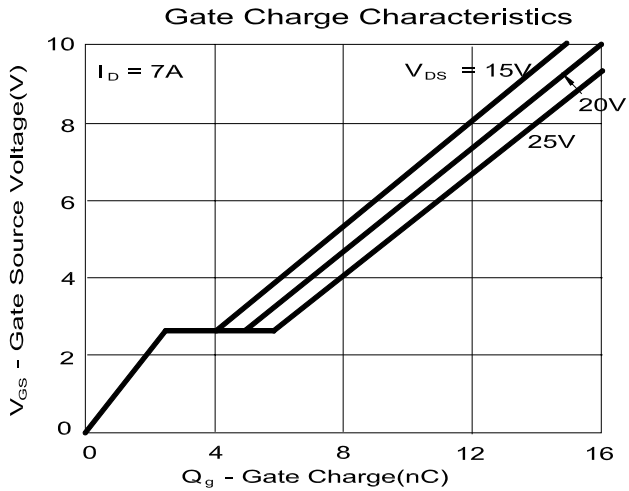


**Transfer Characteristics**



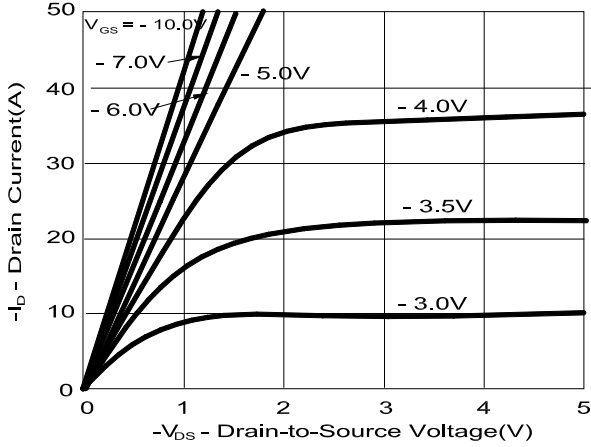
**Body Diode Forward Voltage Variation with Source Current and Temperature**



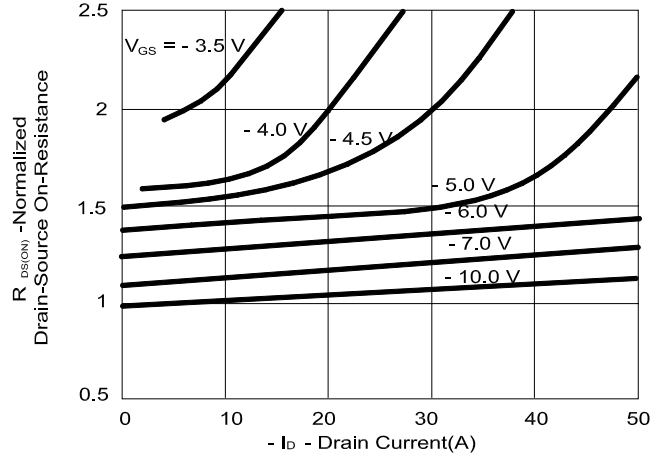


**P-CHANNEL**

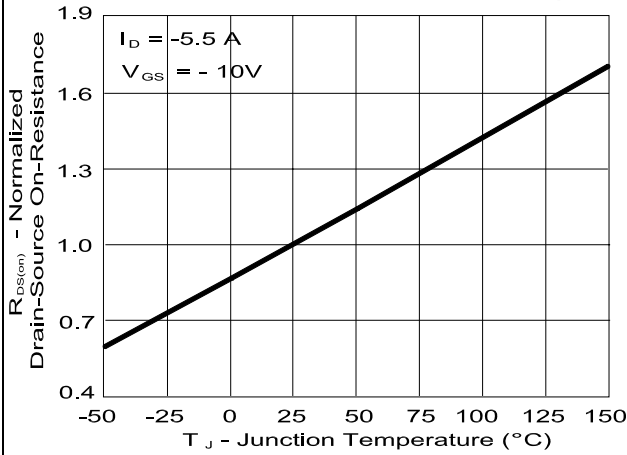
**On-Region Characteristics**



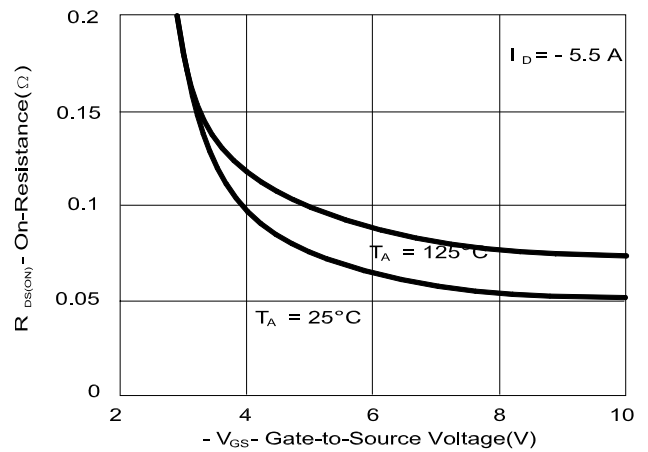
**On-Resistance Variation with Drain Current and Gate Voltage**



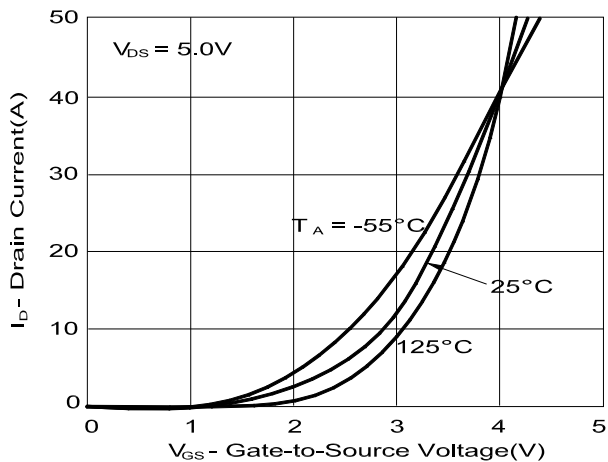
**On-Resistance Variation with Temperature**



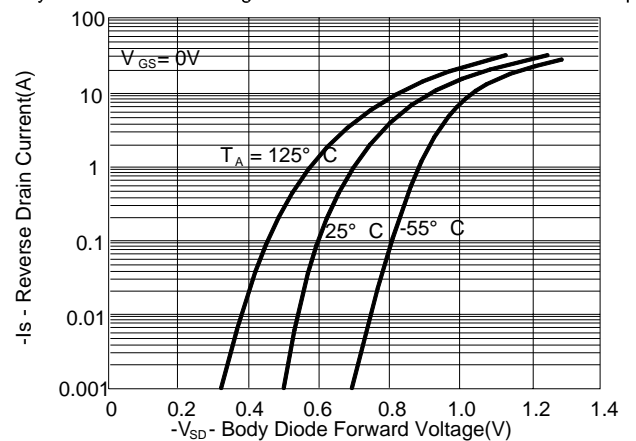
**On-Resistance Variation with Gate-to-Source Voltage**

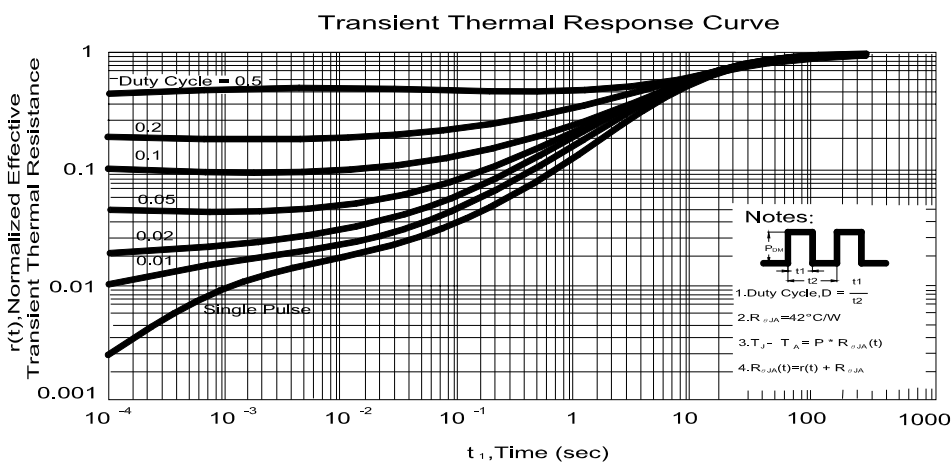
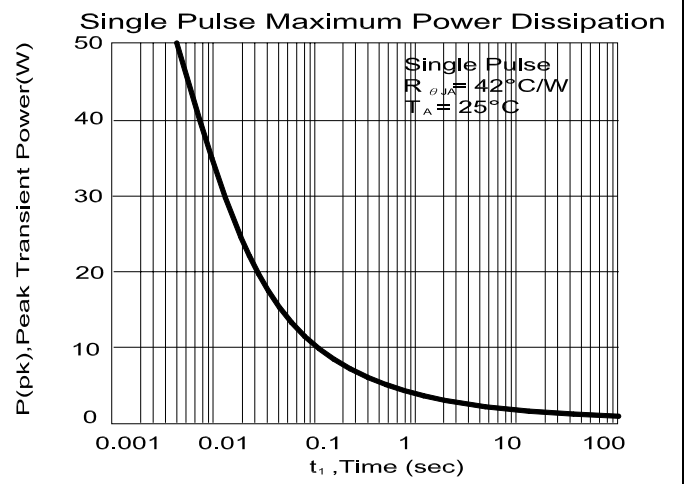
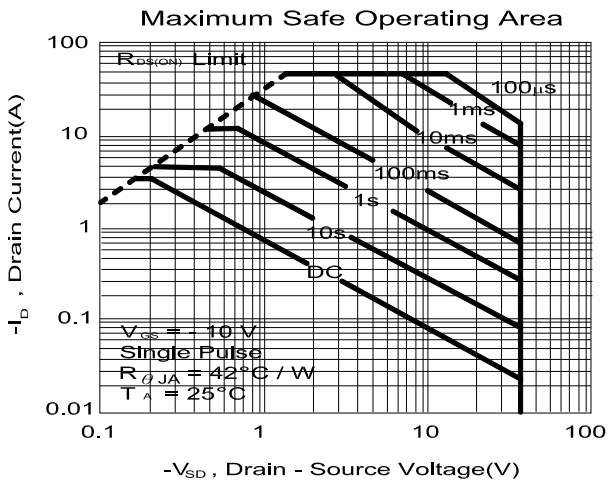
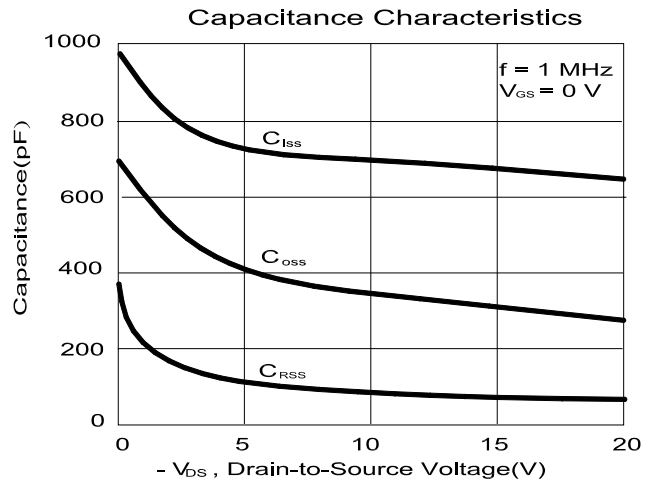
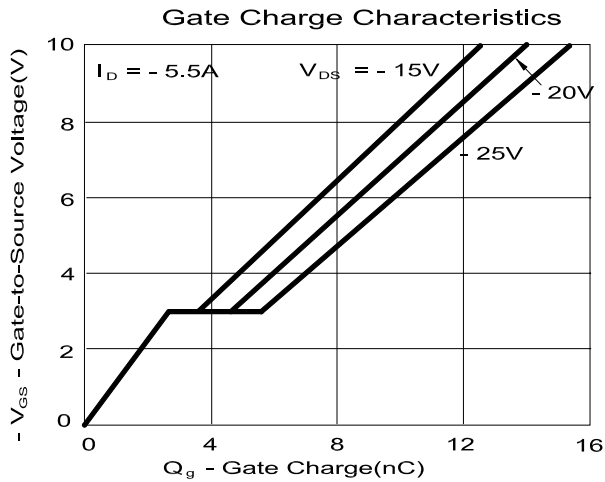


**Transfer Characteristics**



**Body Diode Forward Voltage Variation with Source Current and Temperature**





**TO-252-5 (DPAK) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.0	9.5	10.0	H	1.3	1.5	1.7
B	2.1	2.3	2.5	I	6.3	6.5	6.7
C	0.4	0.5	0.6	J	4.8	5.0	5.2
D	1.1	1.2	1.3	K	0.8	1.3	1.8
E	0.4	0.5	0.6	L	0.3	0.5	0.7
F	0.00		0.3	M	1.1	1.3	1.5
G	5.3	5.5	5.7	N			

