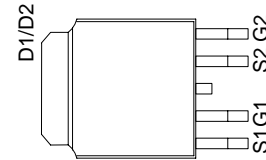
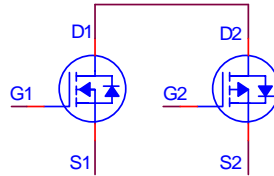


**PRODUCT SUMMARY**

	$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
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 <sub>DS</sub>	40	-40	V
Gate-Source Voltage		V <sub>GS</sub>	±20	±20	V
Continuous Drain Current	T <sub>C</sub> = 25 °C	I <sub>D</sub>	7	-5.5	A
	T <sub>C</sub> = 70 °C		6	-4.5	
Pulsed Drain Current <sup>1</sup>		I <sub>DM</sub>	50	-50	
Power Dissipation	T <sub>C</sub> = 25 °C	P <sub>D</sub>	3		W
	T <sub>C</sub> = 70 °C		2.1		
Junction & Storage Temperature Range		T <sub>j</sub> , T <sub>stg</sub>	-55 to 150		°C
Lead Temperature ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.)		T <sub>L</sub>	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	
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	N-Ch	40			V
		$V_{GS} = 0V, I_D = -250\mu A$	P-Ch	-40			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	N-Ch	1.0	1.5	2.5	
		$V_{DS} = V_{GS}, I_D = -250\mu A$	P-Ch	-1.0	-1.5	-2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	N-Ch			$\pm 100$	nA
		$V_{DS} = 0V, V_{GS} = \pm 20V$	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-Channel	N-Ch		790	988	pF
		P-Channel	P-Ch		690	863	
Output Capacitance	$C_{oss}$	$V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	N-Ch		175	245	
		P-Channel	P-Ch		310	430	
Reverse Transfer Capacitance	$C_{rss}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	N-Ch		65	98	
			P-Ch		75	113	
Total Gate Charge <sup>2</sup>	$Q_g$	N-Channel	N-Ch		16		nC
		$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$	P-Ch		14		
		$I_D = 7A$	N-Ch		2.5		
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	P-Channel	P-Ch		2.2		
		$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$	N-Ch		2.1		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$	$I_D = -5.5A$	P-Ch		1.9		

Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	N-Channel	N-Ch		2.2	4.4	nS
			P-Ch		6.7	13.4	
Rise Time <sup>2</sup>	t <sub>r</sub>	V <sub>DS</sub> = 20V	N-Ch		7.5	15	
		I <sub>D</sub> ≡ 1A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 6	P-Ch		9.7	19.4	
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>	P-Channel	N-Ch		11.8	21.3	
			P-Ch		19.8	35.6	
Fall Time <sup>2</sup>	t <sub>f</sub>	V <sub>DS</sub> = -20V	N-Ch		3.7	7.4	
		I <sub>D</sub> ≡ -1A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 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 <sub>SD</sub>	I <sub>F</sub> = 7A, V <sub>GS</sub> = 0V	N-Ch			1.2	V
		I <sub>F</sub> = -5.5A, V <sub>GS</sub> = 0V	P-Ch			-1.2	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 8A, dI <sub>F</sub> /dt = 100A / μS	N-Ch		42		nS
		I <sub>F</sub> = -7A, dI <sub>F</sub> /dt = 100A / μS	P-Ch		55		
Reverse Recovery Charge	Q <sub>rr</sub>		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.

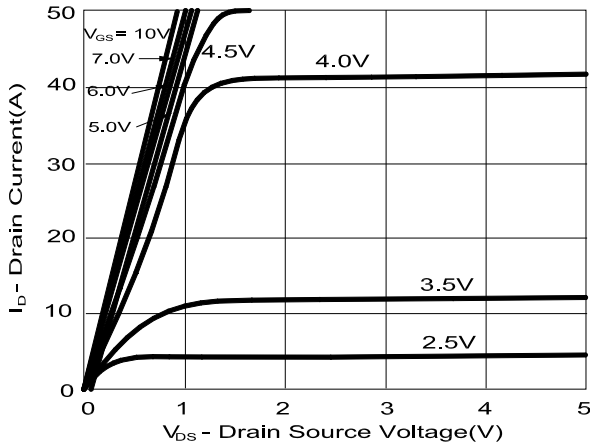
<sup>3</sup>Pulse width limited by maximum junction temperature.

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

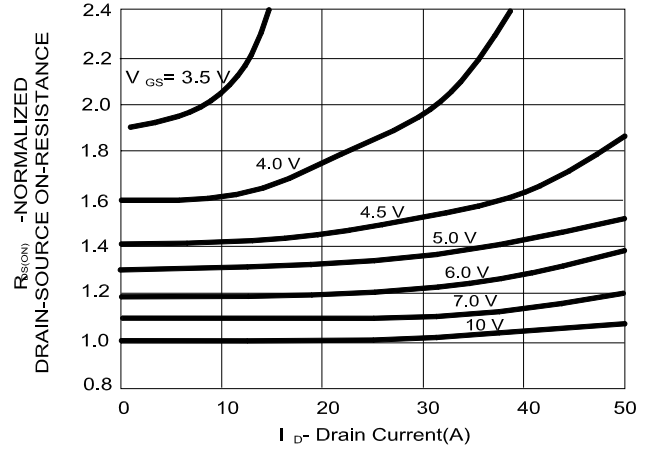
**Orders for parts with Lead-Free plating can be placed using the PXXXXXXG parts name.**

**N-CHANNEL**

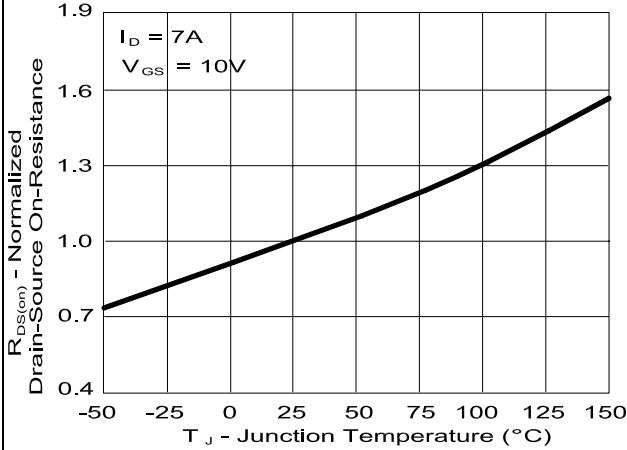
**On-Region Characteristics**



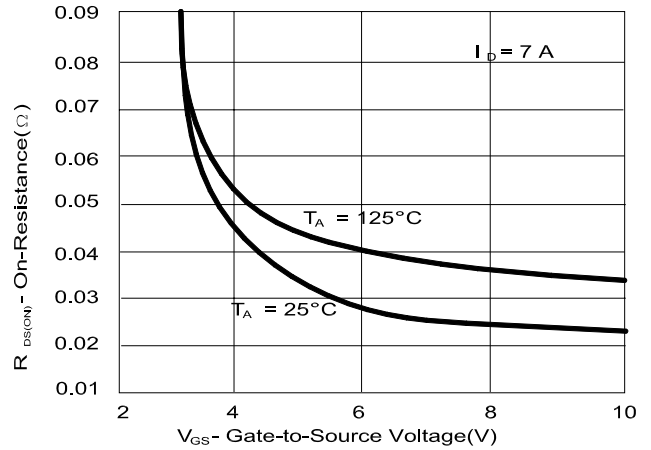
**On-Resistance Variation with Drain Current and Gate Voltage**



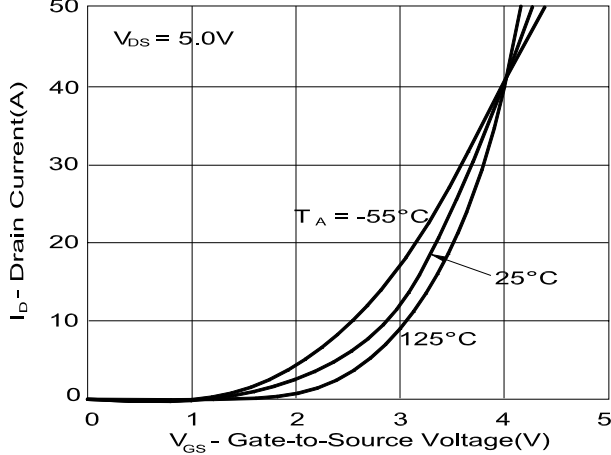
**On-Resistance Variation with Temperature**



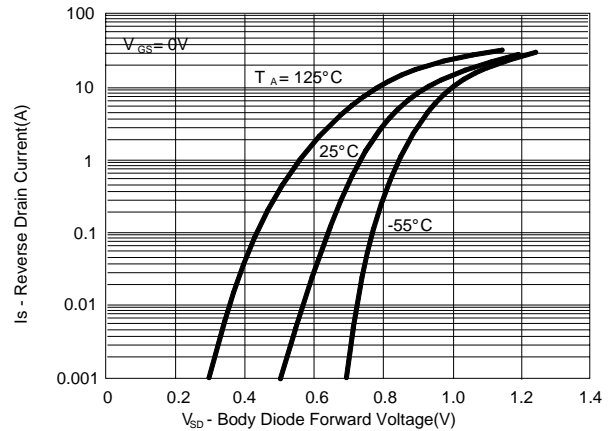
**On-Resistance Variation with Gate-to-Source Voltage**

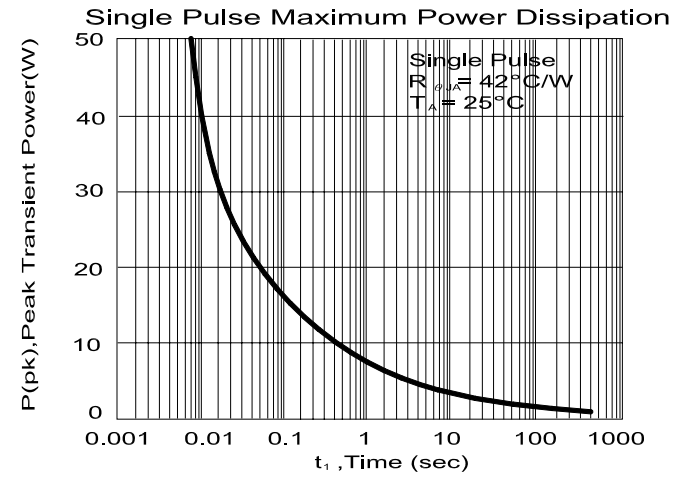
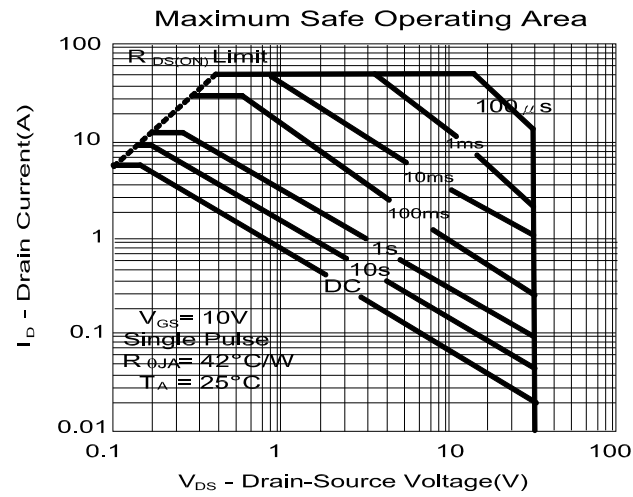
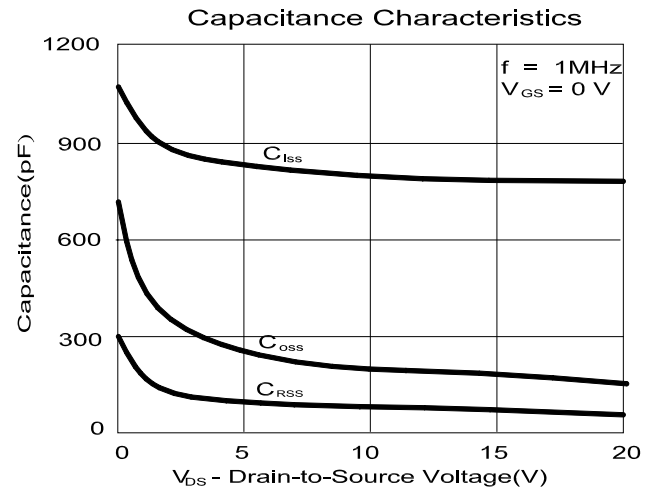
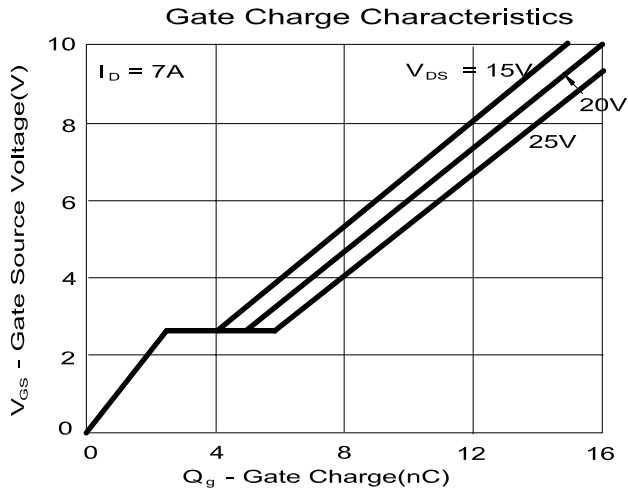


**Transfer Characteristics**



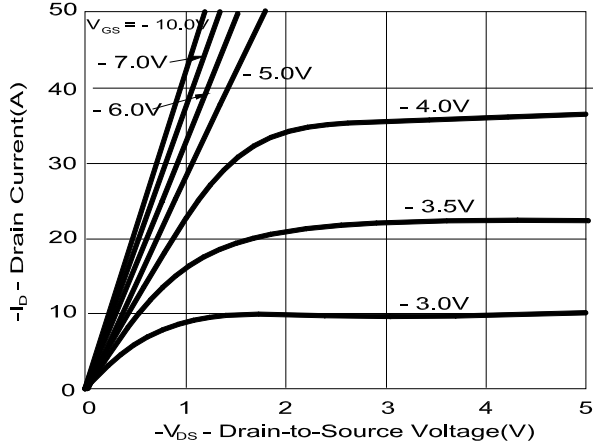
**Body Diode Forward Voltage Variation with Source Current and Temperature**



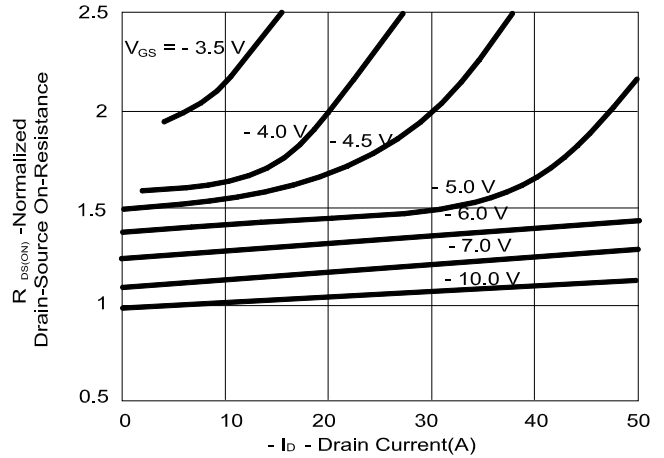


**P-CHANNEL**

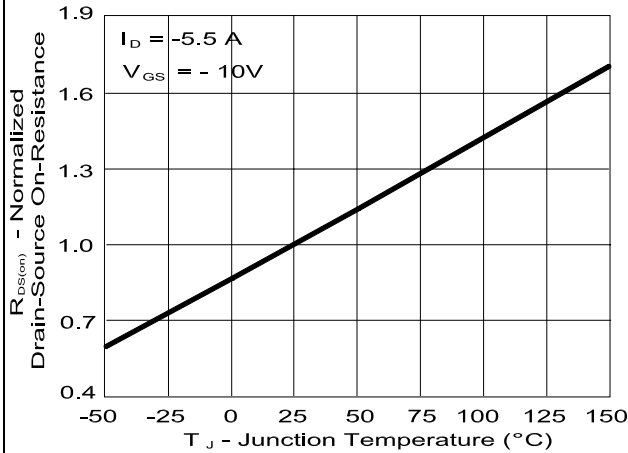
**On-Region Characteristics**



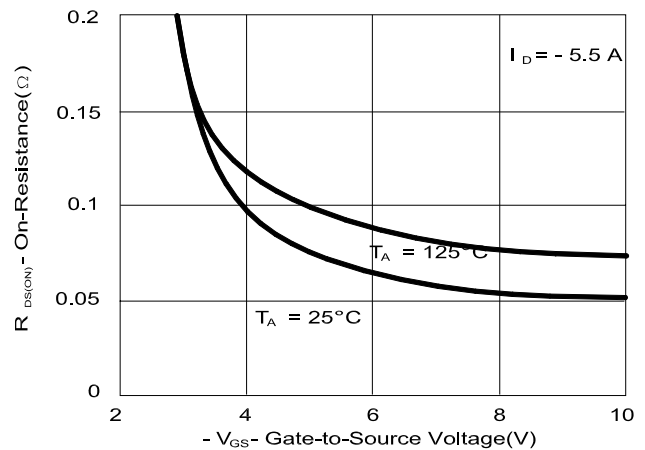
**On-Resistance Variation with Drain Current and Gate Voltage**



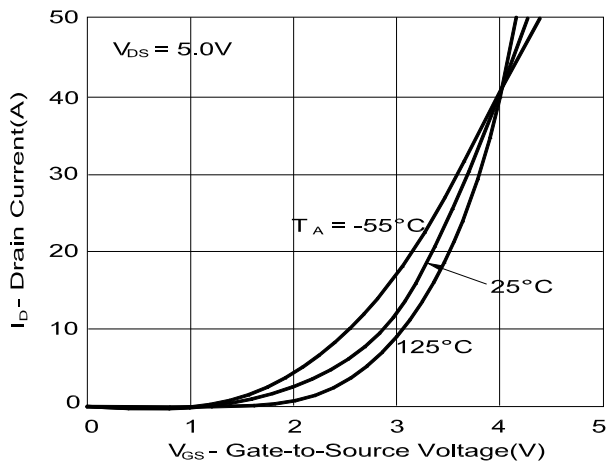
**On-Resistance Variation with Temperature**



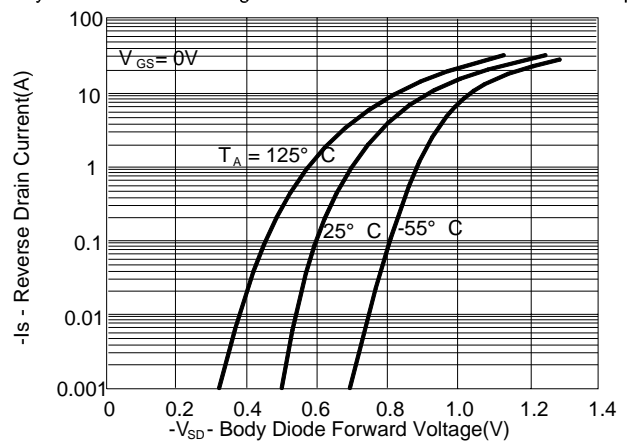
**On-Resistance Variation with Gate-to-Source Voltage**

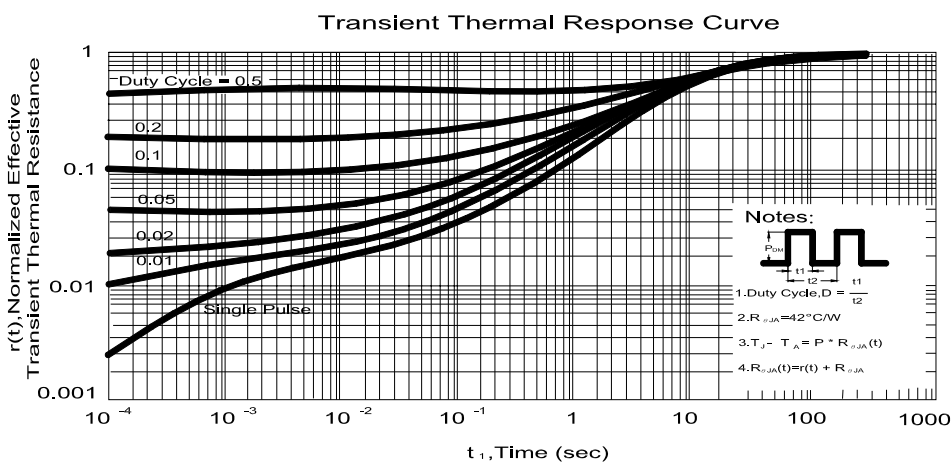
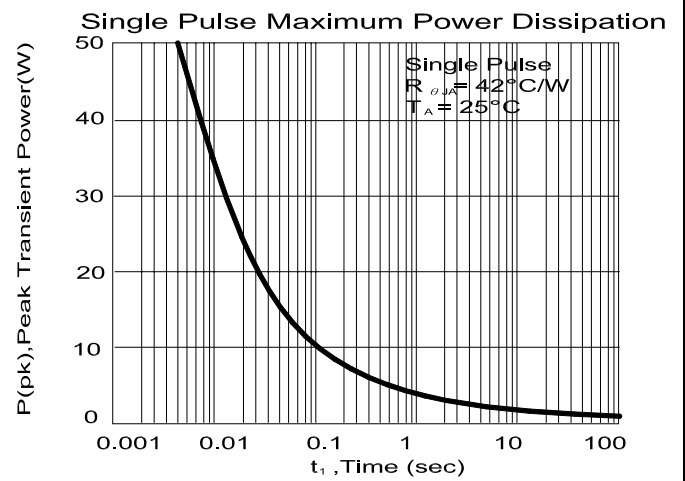
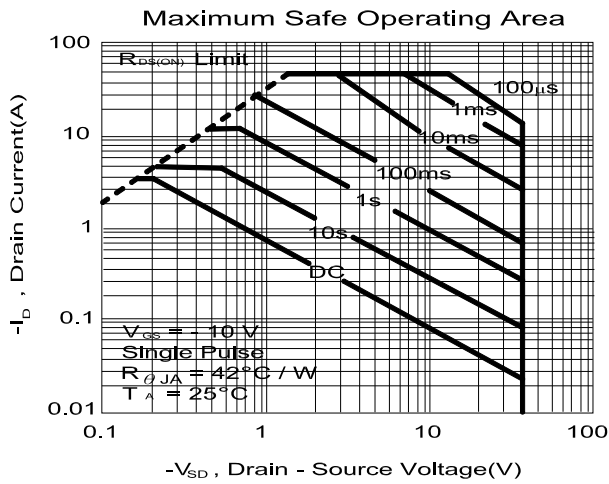
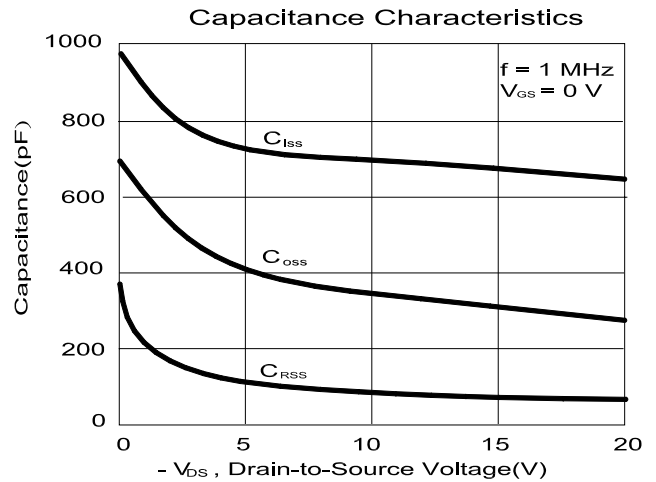
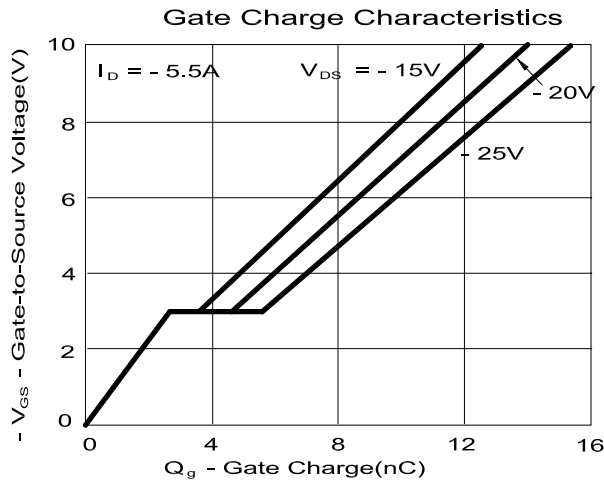


**Transfer Characteristics**



**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			

