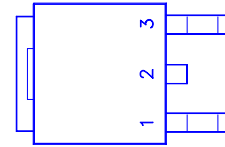
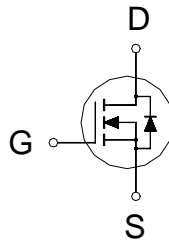


**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
25	20m	45A



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
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	45	A
	$T_C = 100\text{ }^\circ\text{C}$		28	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	140	
Avalanche Current		$I_{AR}$	20	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	140	mJ
Repetitive Avalanche Energy <sup>2</sup>	$L = 0.05\text{mH}$	$E_{AR}$	5.6	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	55	W
	$T_C = 100\text{ }^\circ\text{C}$		33	
Operating 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	$R_{\theta JC}$		3	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		70	
Case-to-Heatsink	$R_{\theta CS}$	0.7		

<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	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	25			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.8	1.2	2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			$\pm 250$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$			25	$\mu\text{A}$
		$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, T_J = 125\text{ }^\circ\text{C}$			250	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 10\text{V}, V_{GS} = 10\text{V}$	45			A

Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = 7V, I_D = 18A$	20	30	m
		$V_{GS} = 10V, I_D = 20A$	15	28	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 15V, I_D = 30A$	16		S

**DYNAMIC**

Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$	600		pF
Output Capacitance	$C_{oss}$		290		
Reverse Transfer Capacitance	$C_{rss}$		100		
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 20A$	25		nC
Gate-Source Charge <sup>2</sup>	$Q_{gs}$		2.9		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$		7.0		
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS} = 15V, R_L = 1$ $I_D \cong 30A, V_{GS} = 10V, R_{GS} = 2.5$	7.0		nS
Rise Time <sup>2</sup>	$t_r$		7.0		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$		24		
Fall Time <sup>2</sup>	$t_f$		6.0		

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

Continuous Current	$I_S$			45	A
Pulsed Current <sup>3</sup>	$I_{SM}$			150	
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = I_S, V_{GS} = 0V$		1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = I_S, di_F/dt = 100A / \mu S$		37	nS
Peak Reverse Recovery Current	$I_{RM(REC)}$		200		A
Reverse Recovery Charge	$Q_{rr}$		0.043		$\mu C$

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

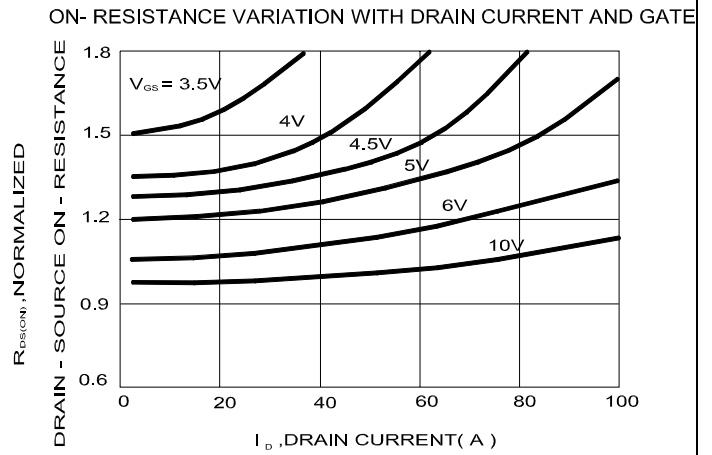
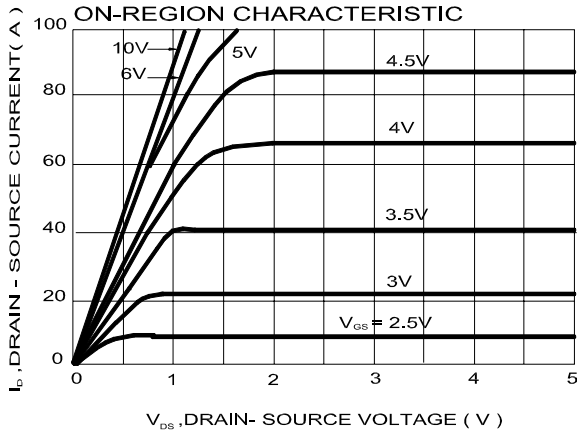
<sup>2</sup>Independent of operating temperature.

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

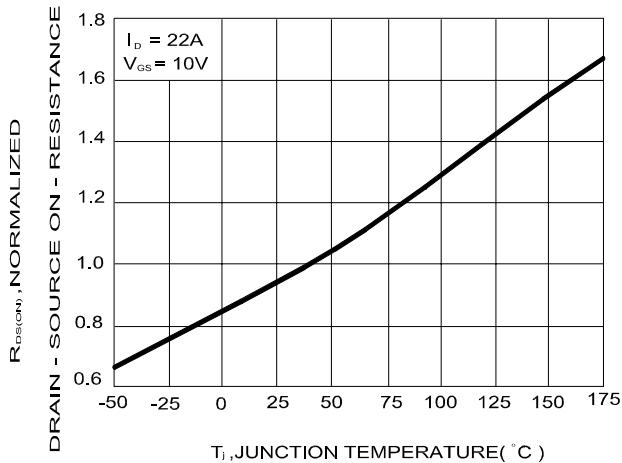
**REMARK: THE PRODUCT MARKED WITH "P45N02LDG", DATE CODE or LOT #**

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

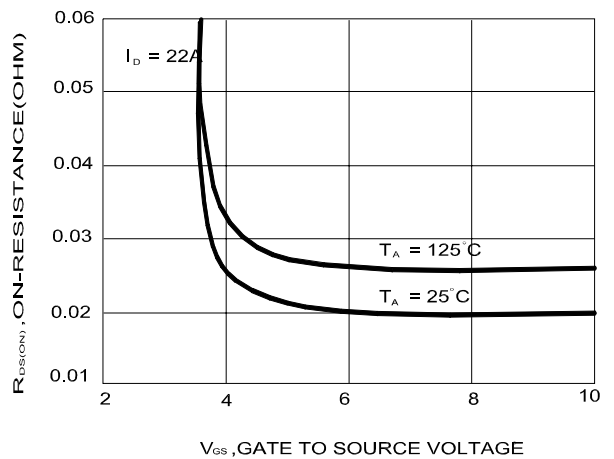
**TYPICAL CHARACTERISTICS**



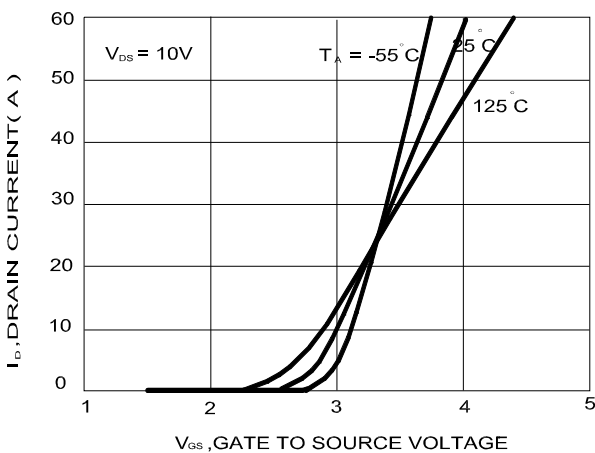
**ON-RESISTANCE VARIATION WITH TEMPERATURE**



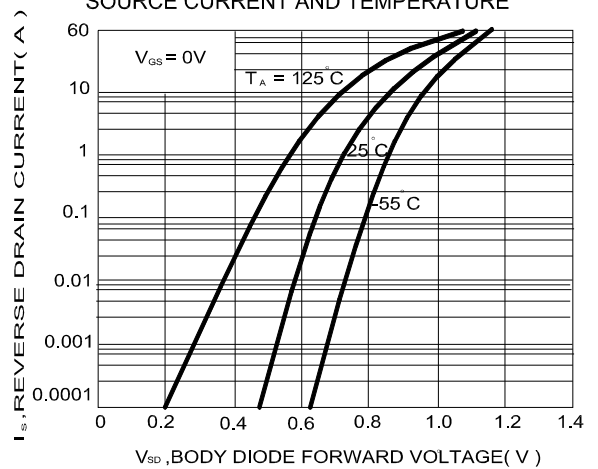
**ON-RESISTANCE VARIATION WITH GATE-TO-SOURCE VOLTAGE**

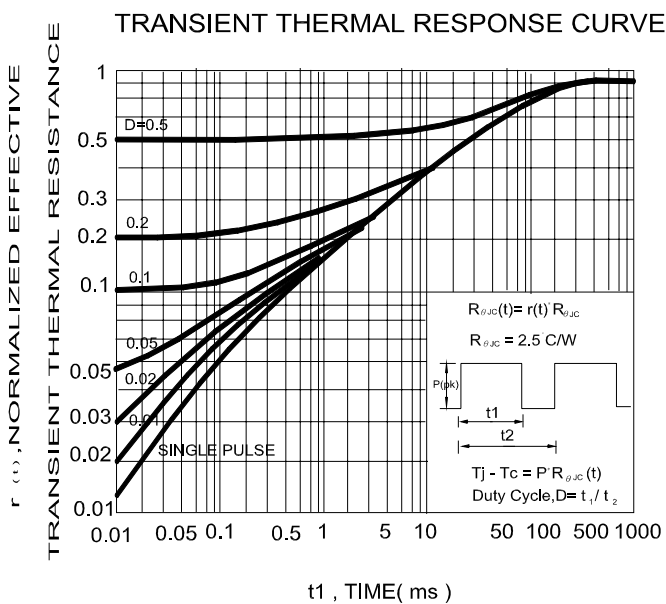
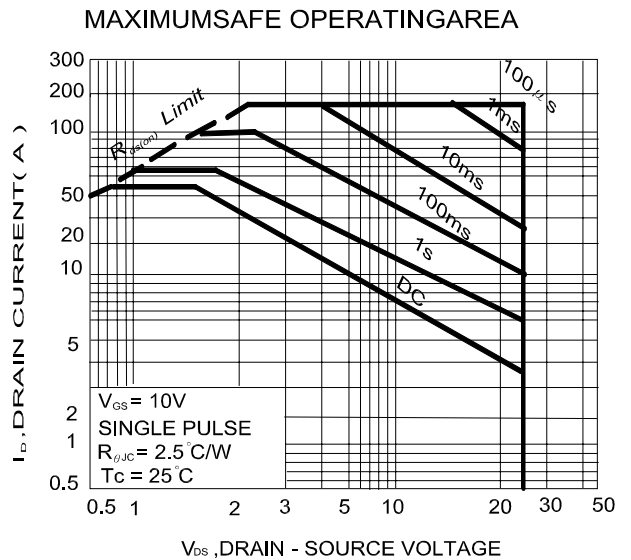
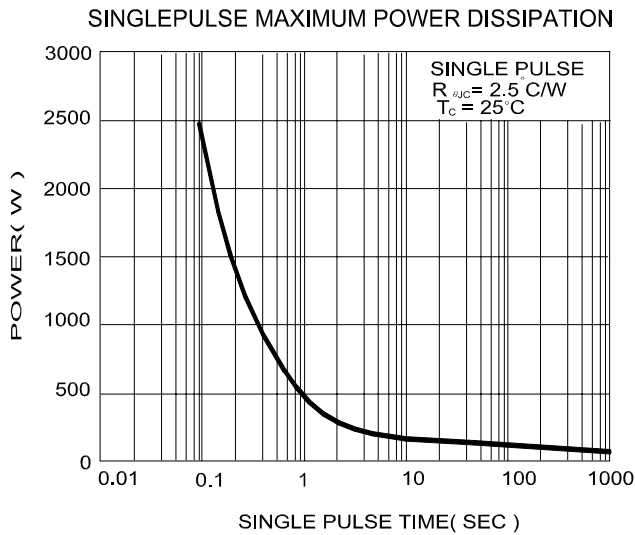
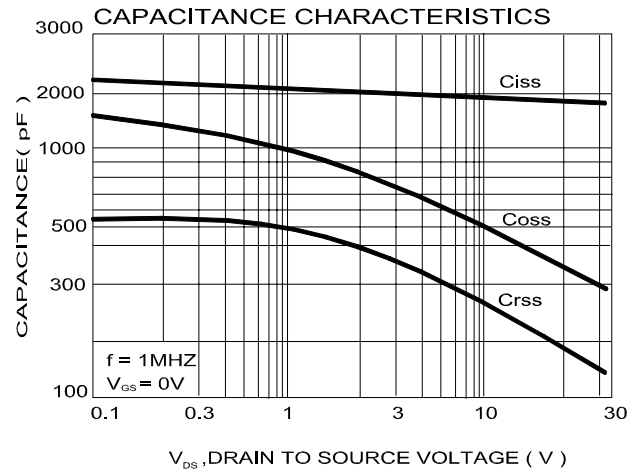
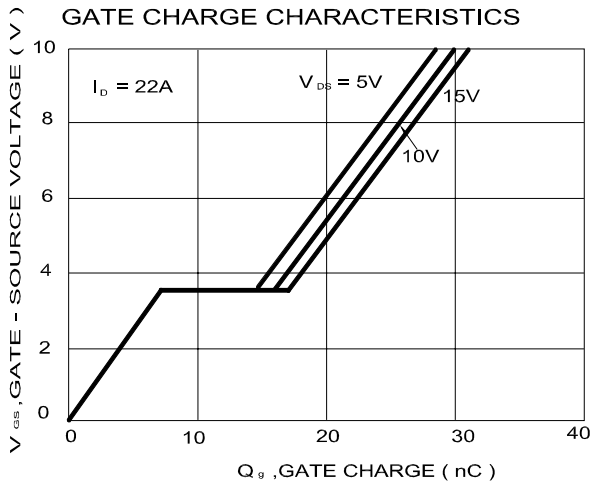


**TRANSFER CHARACTERISTICS**



**BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE**





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

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.35		10.4	H	0.89		2.03
B	2.2		2.4	I	6.35		6.80
C	0.45		0.6	J	5.2		5.5
D	0.89		1.5	K	0.6		1
E	0.45		0.69	L	0.5		0.9
F	0.03		0.23	M	3.96	4.57	5.18
G	5.2		6.2	N			

