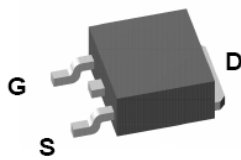


# P2504BDG

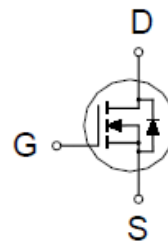
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
40V	25mΩ @ $V_{GS} = 10V$	32A



TO-252



**100% Rg tested**  
**100% UIS tested**

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	40	V
Gate-Source Voltage		$V_{GS}$	±20	
Continuous Drain Current	$T_C = 25\text{ °C}$	$I_D$	32	A
	$T_C = 100\text{ °C}$		20	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	70	
Avalanche Current		$I_{AS}$	17	
Avalanche Energy	$L = 0.3\text{mH}$	$E_{AS}$	44	mJ
Power Dissipation	$T_C = 25\text{ °C}$	$P_D$	41.6	W
	$T_C = 100\text{ °C}$		16.6	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	°C

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		75	

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

# P2504BDG

## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

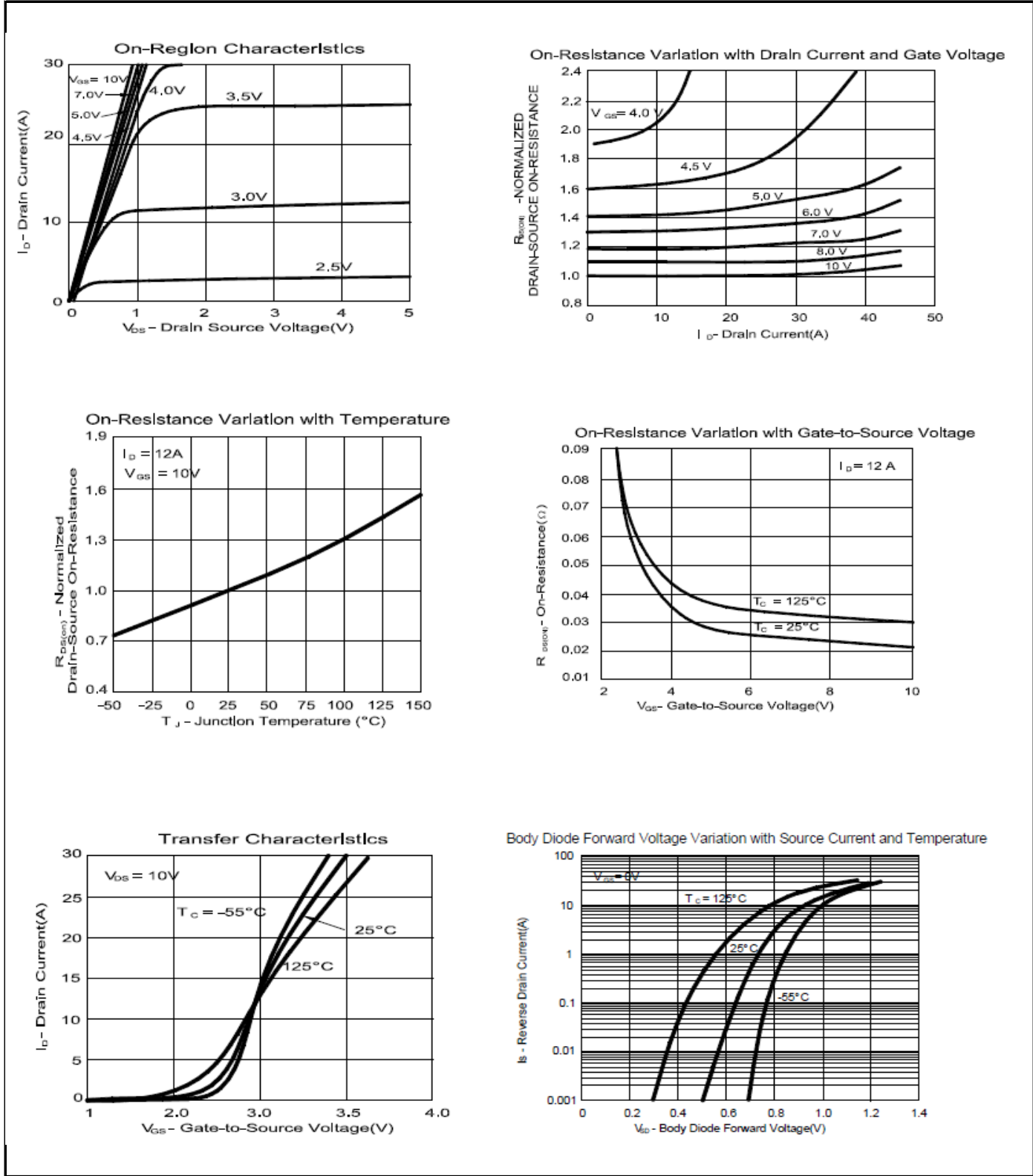
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.7	1.9	2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±250	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 32V, V <sub>GS</sub> = 0V			1	μA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C			10	
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V	70			A
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 5V, I <sub>D</sub> = 10A		27	45	mΩ
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A		21	25	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 12A		18		S
<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 20V, f = 1MHz		760		pF
Output Capacitance	C <sub>oss</sub>			165		
Reverse Transfer Capacitance	C <sub>rss</sub>			110		
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> , V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A		16		nC
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			2.5		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			2.1		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1.5	3	Ω
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = 20V, R <sub>L</sub> = 1Ω I <sub>D</sub> ≅ 1A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 6Ω		2.1	4.2	nS
Rise Time <sup>2</sup>	t <sub>r</sub>			7.2	14	
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			11.6	21	
Fall Time <sup>2</sup>	t <sub>f</sub>			3.5	7.2	
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				32	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = 12A, V <sub>GS</sub> = 0V			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 5A, dI <sub>F</sub> /dt = 100A / μS		14.5		nS
Reverse Recovery Charge	Q <sub>rr</sub>				7.2	

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

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

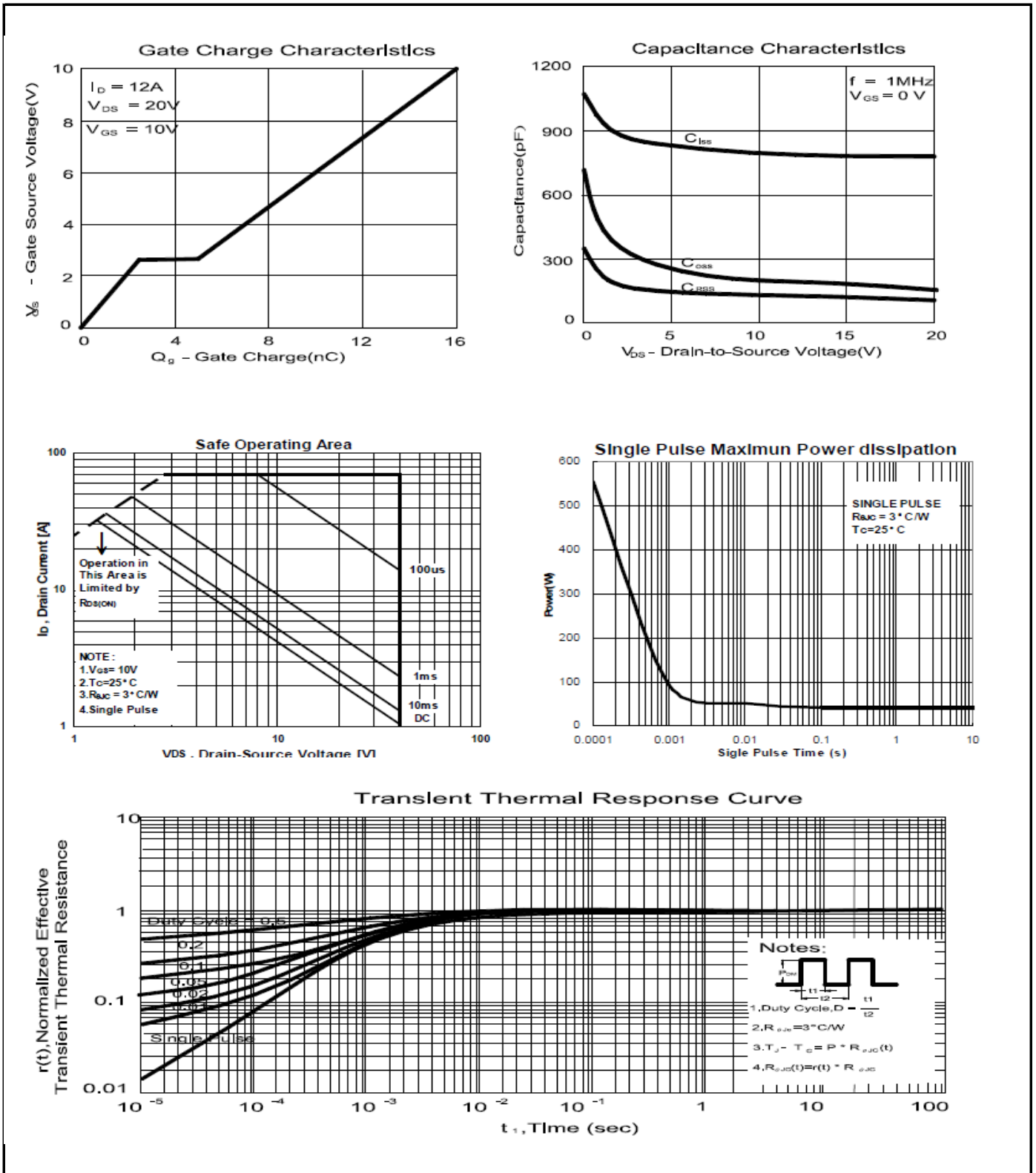
# P2504BDG

## N-Channel Enhancement Mode MOSFET



# P2504BDG

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# P2504BDG

## N-Channel Enhancement Mode MOSFET

### Package Dimension

### TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	10	10.41	J	4.8		5.64
B	2.1	2.2	2.5	K	0.15		1.49
C	0.4	0.5	0.61	L	0.4	0.76	0.91
D	0.82	1.2	1.5	M	4.2	4.58	5
E	0.35	0.5	0.65	S	4.57	5.1	5.52
F	0		0.2	T	3.81	4.75	5.24
G	5.3	6.1	6.3	U	1.4		1.78
H	0.5		1.7	V	0.55	1.25	1.7
I	6.3	6.5	6.8				

