IPG20N10S4-36A-VB Datasheet

Dual N-Channel 100V (D-S) MOSFET

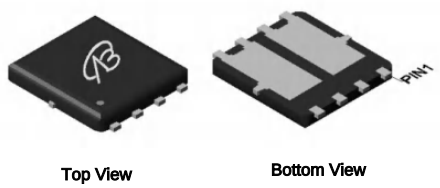
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]
100	0.018 at V_{GS} = 10 V	25
	0.022 at V_{GS} = 4.5 V	20

FEATURES

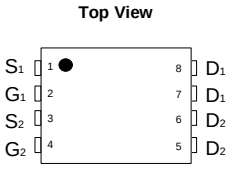
- 175 °C Junction Temperature
- Trench technology Power MOSFET
- Material categorization:

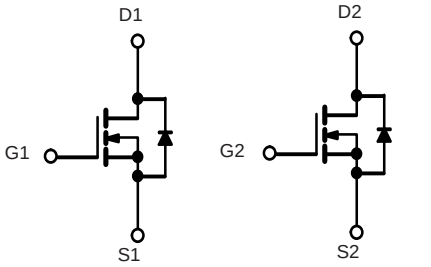
RoHS COMPLIANT

DFN8(5X6)-B



Top View Bottom View





N-Channel MOSFET N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J = 175 °C)[b]	T_C = 25 °C	I_D	25	A
	T_C = 100 °C		15[a]	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction)		I_S	76[a]	
Avalanche Current		I_{AS}	15	
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.5 mH	E_{AS}	55	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	27	W
	T_A = 25 °C		3[b], 8.3[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	15	18	°C/W
	Steady State		50	60	
Maximum Junction-to-Case		R_{thJC}	4.5	5.5	

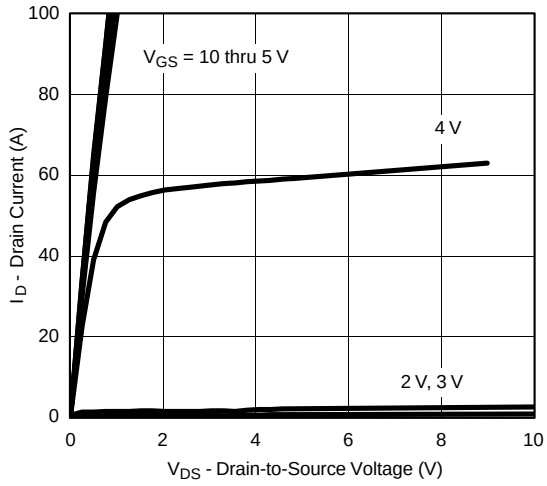
Notes:
a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.
c. t ≤ 10 s.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.[a]**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1	2	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0 V			1	µA
		V_{DS} = 80V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 8 0V, V_{GS} = 0 V, T_J = 175 °C			250	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A		0.018		Ω
		V_{GS} = 10 V, I_D = 20 A, T_J = 125 °C		0.027		
		V_{GS} = 10 V, I_D = 20 A, T_J = 175 °C		0.036		
		V_{GS} = 4.5 V, I_D = 12A		0.022		
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 20 A		70		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 20 V, f = 1 MHz		1100		pF
Output Capacitance	C_{oss}			200		
Reverse Transfer Capacitance	C_{rss}			90		
Total Gate Charge[c]	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 10 A		7	15	nC
Gate-Source Charge[c]	Q_{gs}			3.5		
Gate-Drain Charge[c]	Q_{gd}			3.1		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 0.6 Ω I_D ≅ 10 A, V_{GEN} = 10 V, R_g = 2.5 Ω		10	15	ns
Rise Time[c]	t_r			15	25	
Turn-Off Delay Time[c]	$t_{d(off)}$			15	30	
Fall Time[c]	t_f			10	30	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Pulsed Current	I_{SM}				80	A
Diode Forward Voltage	V_{SD}	I_F = 20 A, V_{GS} = 0 V		1	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 20 A, di/dt = 100 A/µs		4	135	ns

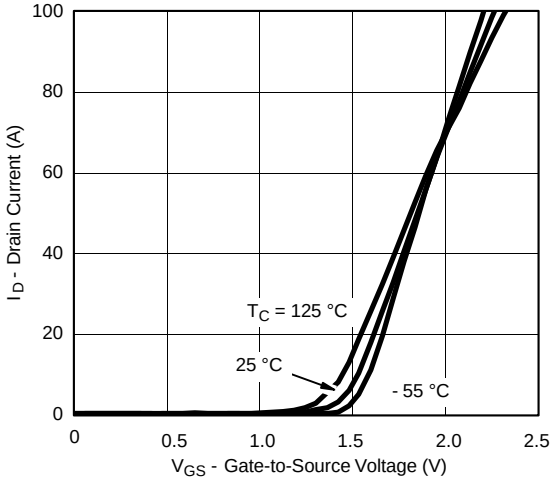
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

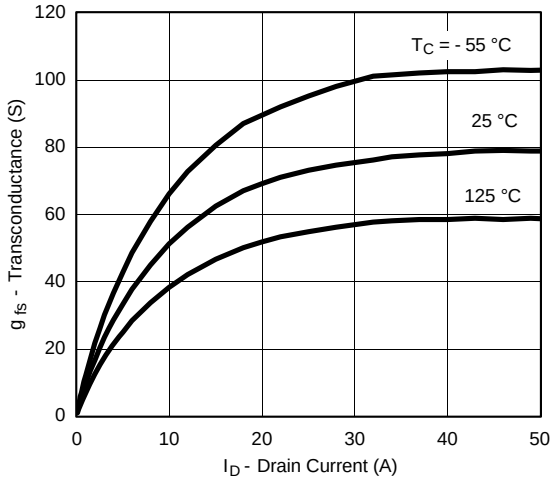
TYPICAL CHARACTERISTICS (25 °C unless noted)



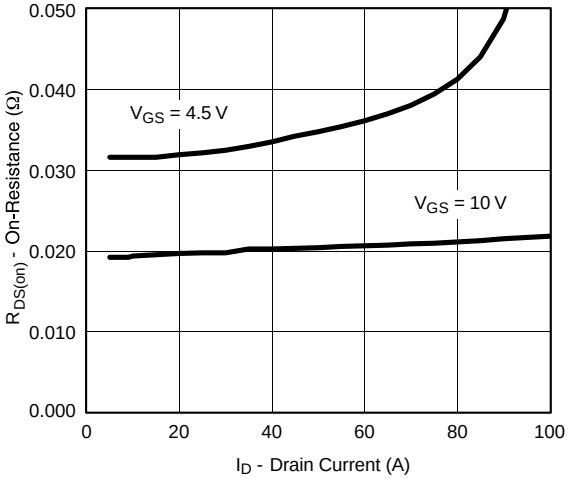
Output Characteristics



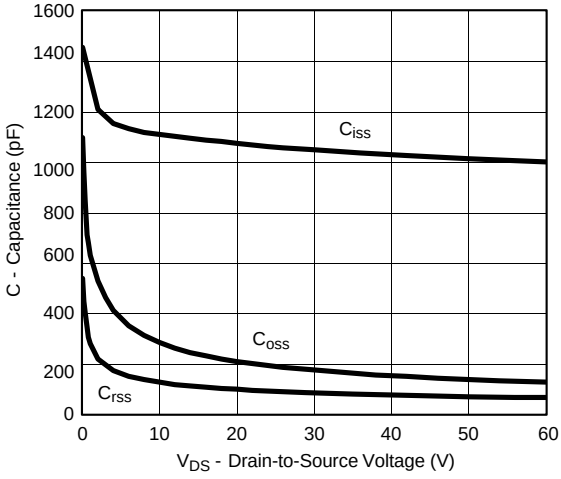
Transfer Characteristics



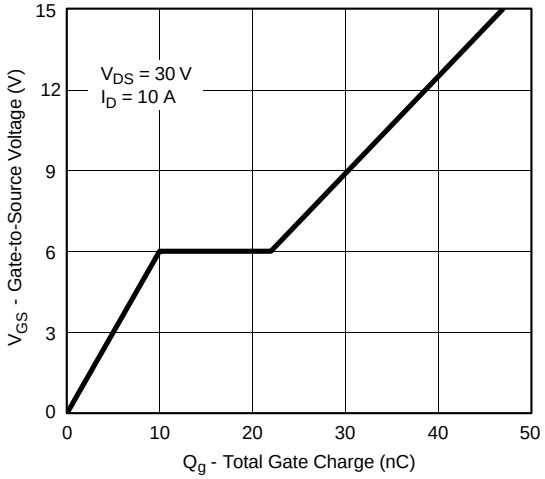
Transconductance



On-Resistance vs. Drain Current

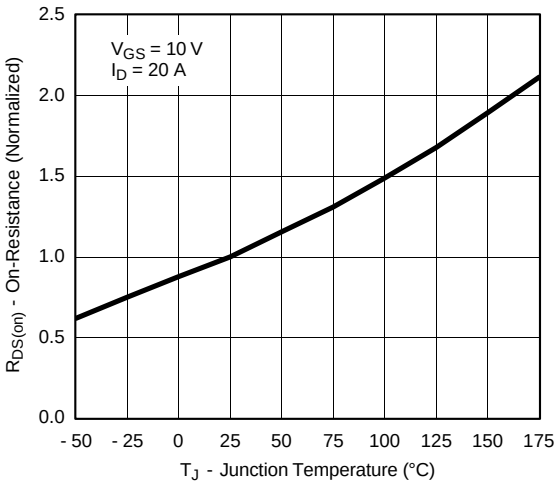


Capacitance

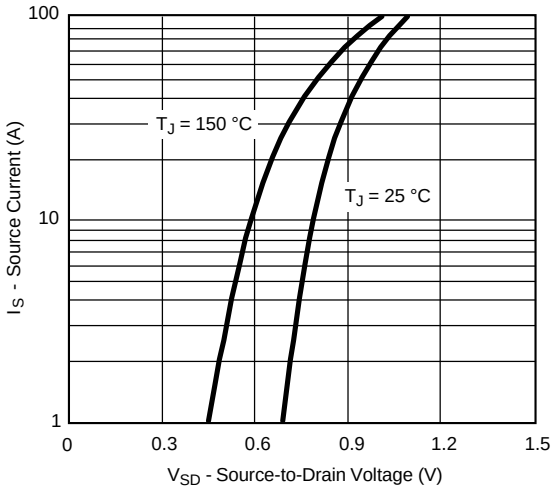


Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

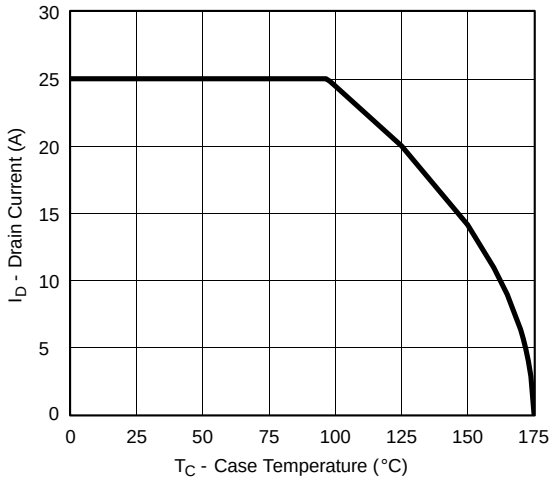


On-Resistance vs. Junction Temperature

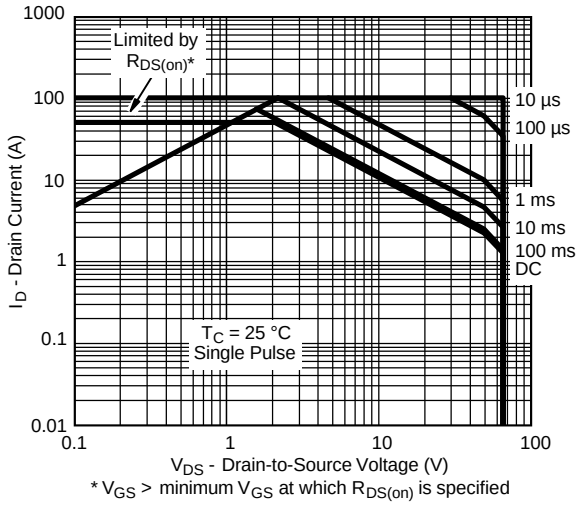


Source-Drain Diode Forward Voltage

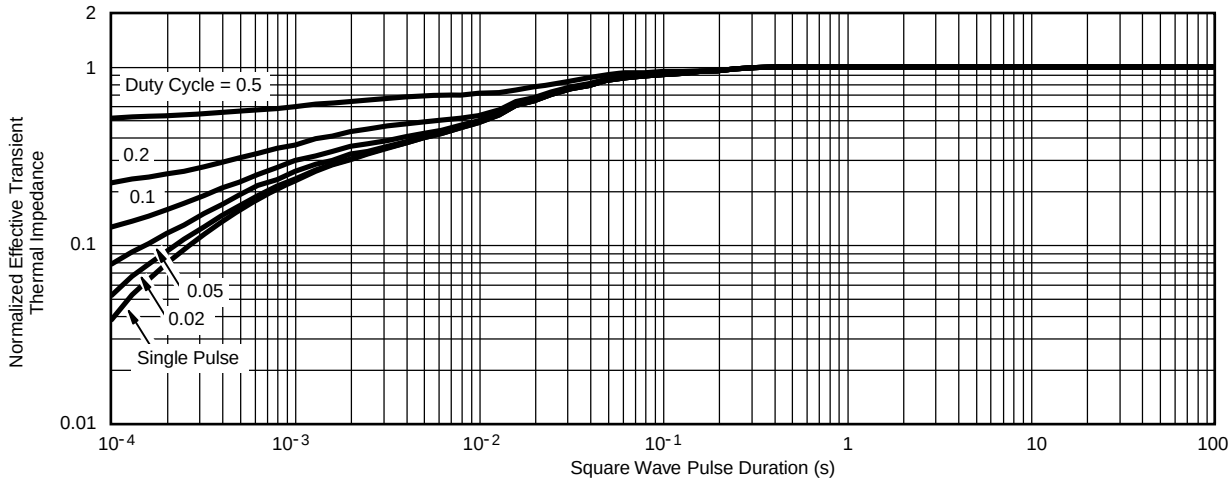
THERMAL RATINGS



Maximum Drain Current vs. Case Temperature

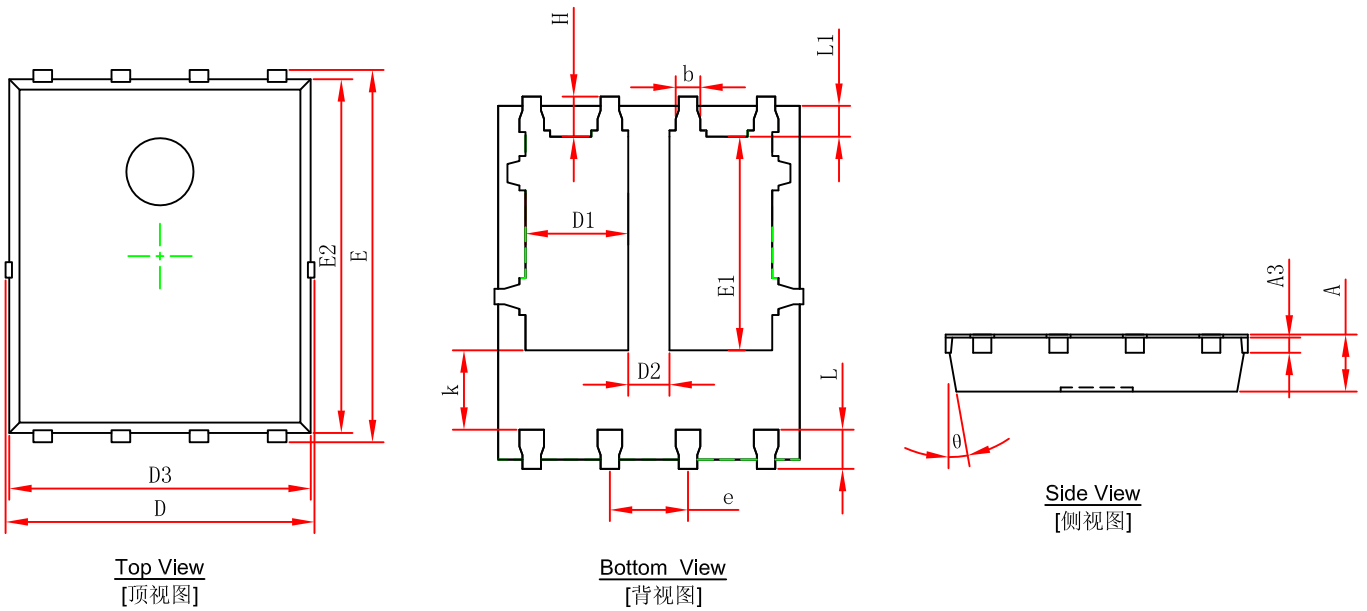


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

DFN8(5X6)-B Package Outline Dimensions



Top View
[顶视图]

Bottom View
[背视图]

Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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