

Dual N-Channel Advanced Power MOSFET

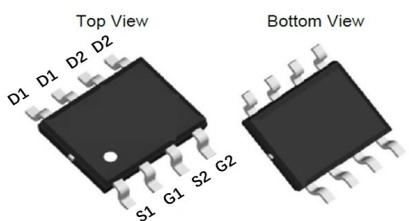
Features

- $V_{DS} = 100V$, $I_D = 12A$
 $R_{DS(ON)} < 12 m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 14 m\Omega$ @ $V_{GS} = 4.5V$

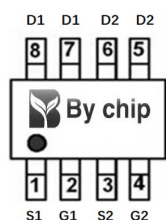
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

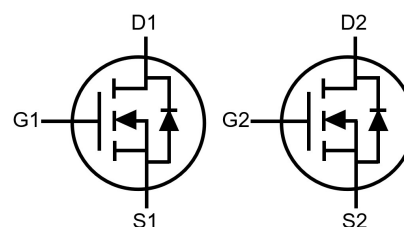
100% UIS TESTED!
100% ΔV_{ds} TESTED!



SOP-8 (Dual)



Pin Assignment



Schematic diagram

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ C$)	$T_C = 25^\circ C$	I_D	12	A
	$T_C = 70^\circ C$		9.6	
	$T_A = 25^\circ C$		10 ^{b, c}	
	$T_A = 70^\circ C$		8.3 ^{b, c}	
Pulsed Drain Current ($t = 300 \mu s$)		I_{DM}	45	A
Continuous Source-Drain Diode Current	$T_C = 25^\circ C$	I_S	5.4	
	$T_A = 25^\circ C$		2.7 ^{b, c}	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	30	mJ
Avalanche Energy		E_{AS}	45	
Maximum Power Dissipation	$T_C = 25^\circ C$	P_D	6	W
	$T_C = 70^\circ C$		3.8	
	$T_A = 25^\circ C$		3 ^{b, c}	
	$T_A = 70^\circ C$		1.9 ^{b, c}	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	$t \leq 10 s$	R_{thJA}	33	42	$^\circ C/W$
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	16	21	

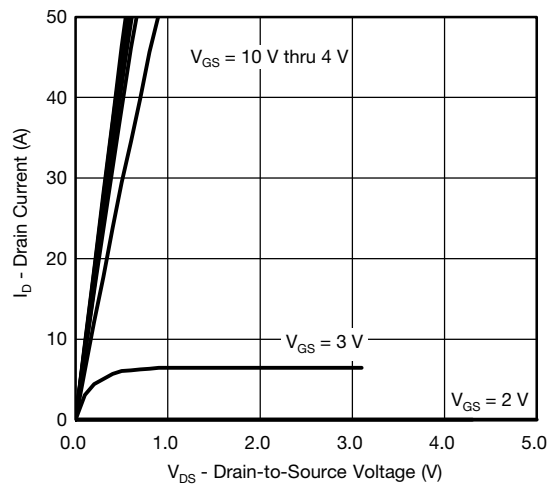
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		64		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.8		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		2.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	30			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 10A			0.012	Ω
		V _{GS} = 7.5 V, I _D = 10 A			0.013	
		V _{GS} = 4.5 V, I _D = 8A			0.014	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 10 A		54		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		1970		pF
Output Capacitance	C _{oss}			695		
Reverse Transfer Capacitance	C _{rss}			62		
Total Gate Charge	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 8 A		44.4	67	nC
		V _{DS} = 50 V, V _{GS} = 4.5 V, I _D = 8 A		20.7	31	
Gate-Source Charge	Q _{gs}			6.1		
Gate-Drain Charge	Q _{gd}			9.1		
Output Charge	Q _{oss}	V _{DS} = 50 V, V _{GS} = 0 V		56	85	
Gate Resistance	R _g	f = 1 MHz	0.4	1.1	2.2	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, R _L = 5 Ω I _D ≅ 10 A, V _{GEN} = 7.5 V, R _g = 1 Ω		15	30	ns
Rise Time	t _r			11	22	
Turn-Off Delay Time	t _{d(off)}			31	60	
Fall Time	t _f			10	20	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, R _L = 5 Ω I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω		12	24	
Rise Time	t _r			10	20	
Turn-Off Delay Time	t _{d(off)}			34	65	
Fall Time	t _f			10	20	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			5.4	A
Pulse Diode Forward Current ^a	I _{SM}				70	
Body Diode Voltage	V _{SD}	I _S = 5 A		0.76	1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs, T _J = 25 °C		42	80	ns
Body Diode Reverse Recovery Charge	Q _{rr}			40	80	nC
Reverse Recovery Fall Time	t _a			19		ns
Reverse Recovery Rise Time	t _b			23		

Notes:

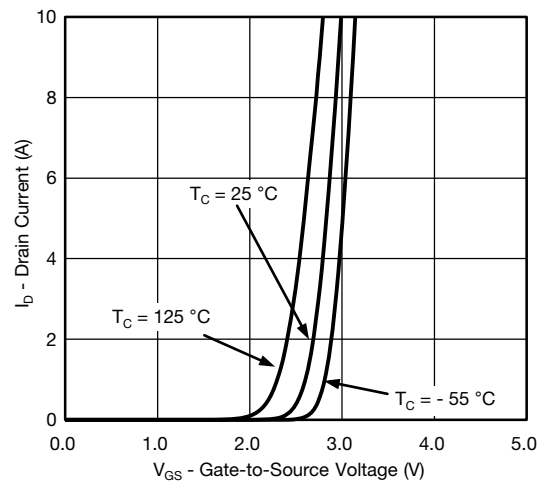
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.

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.

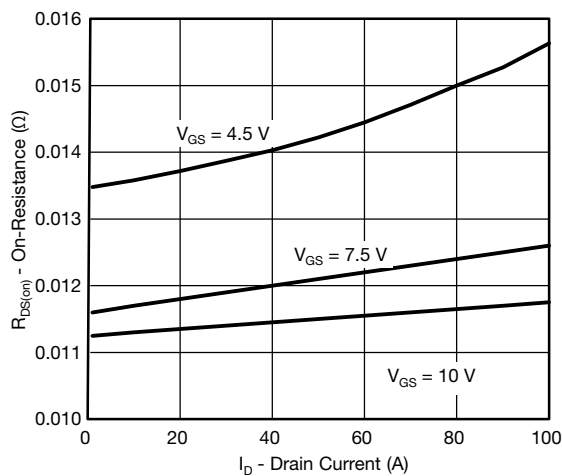
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



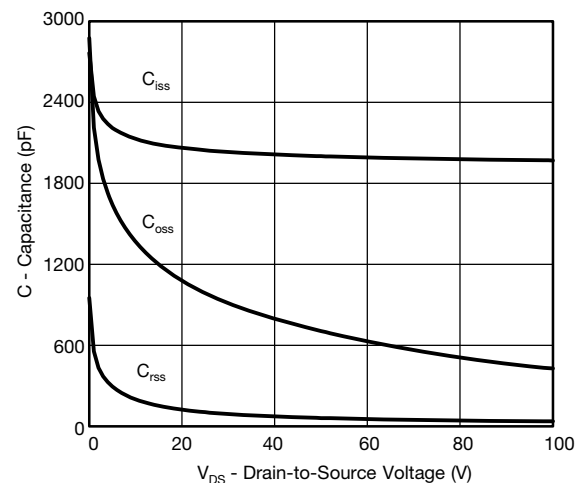
Output Characteristics



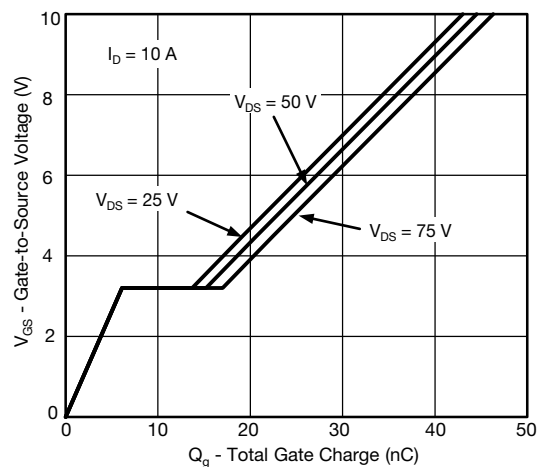
Transfer Characteristics



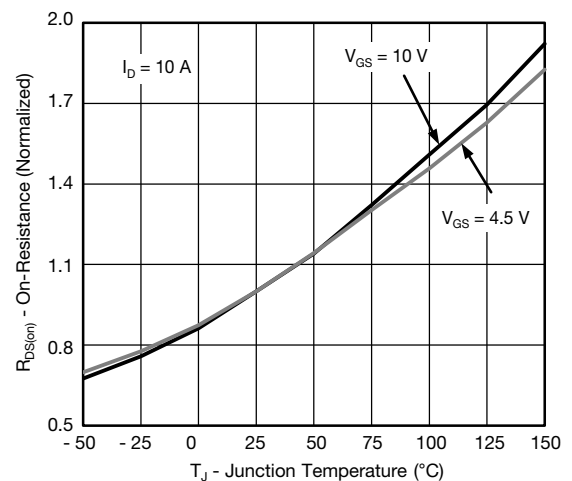
On-Resistance vs. Drain Current



Capacitance

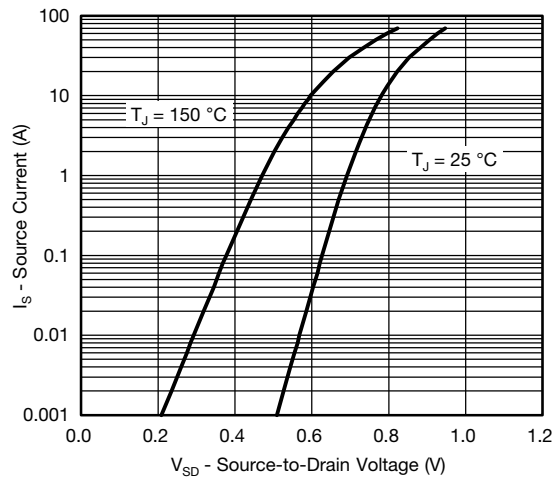


Gate Charge

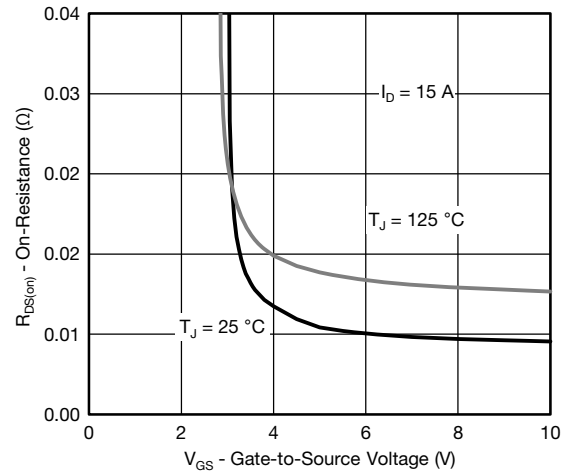


On-Resistance vs. Junction Temperature

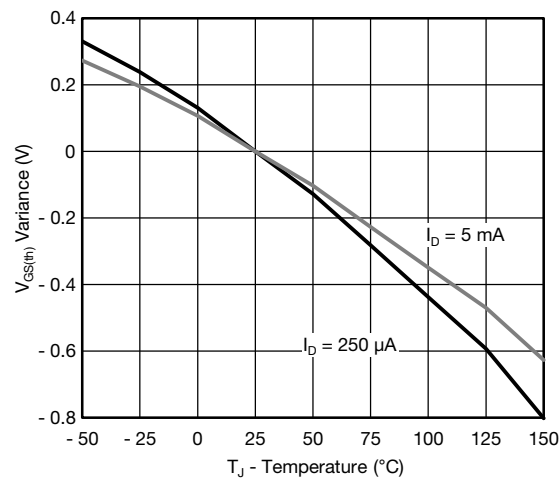
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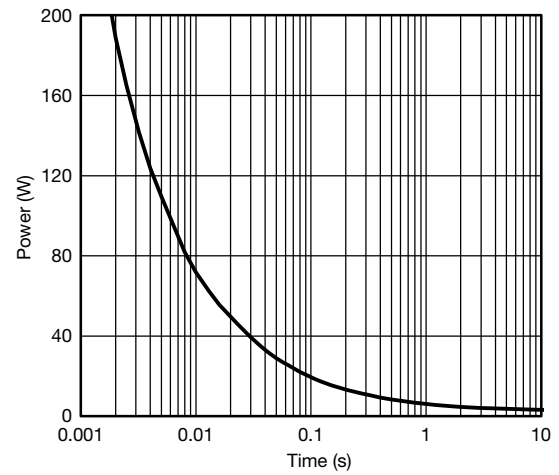
Source-Drain Diode Forward Voltage



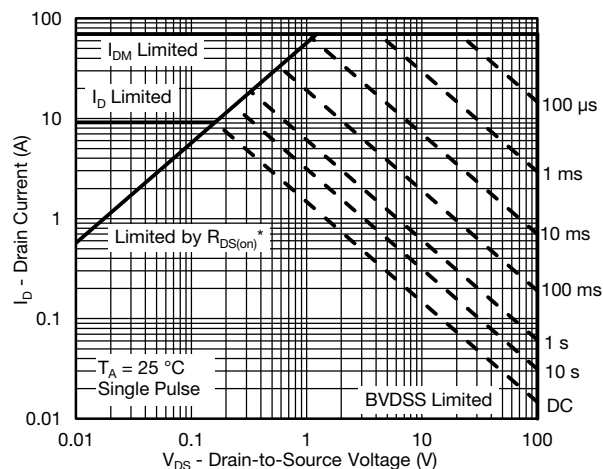
On-Resistance vs. Gate-to-Source Voltage



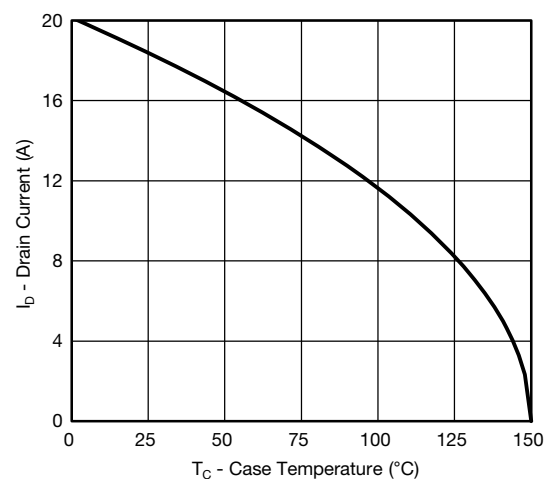
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

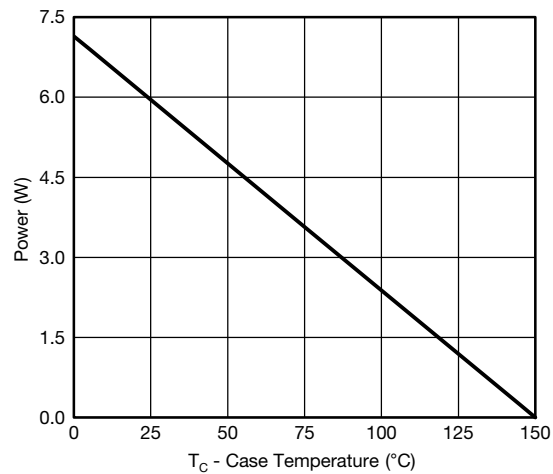


Safe Operating Area, Junction-to-Ambient

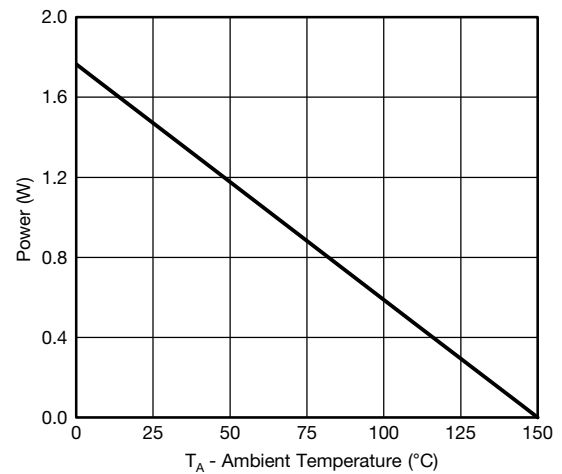


Current Derating*

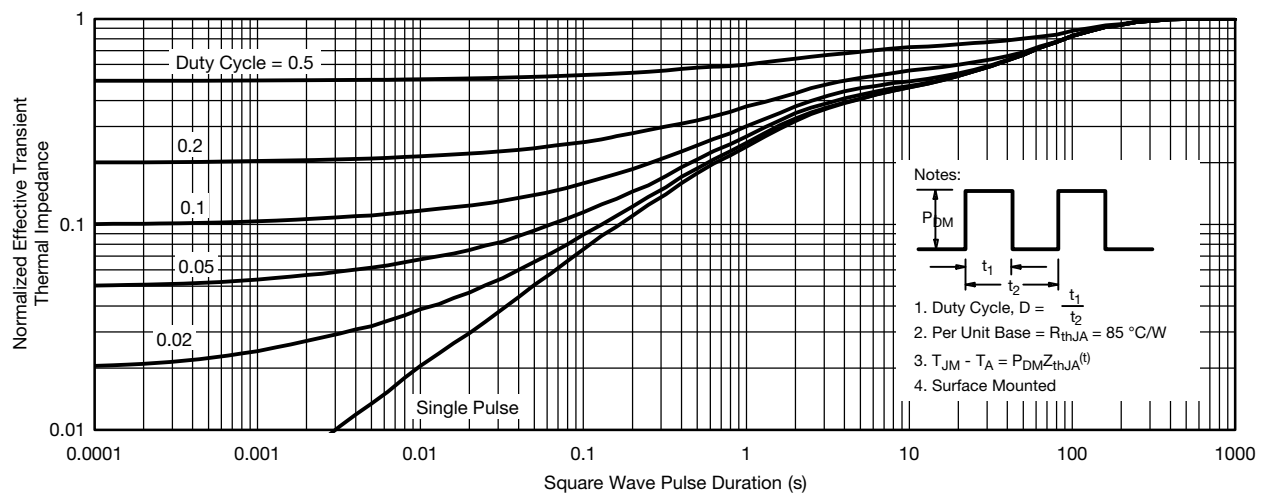
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



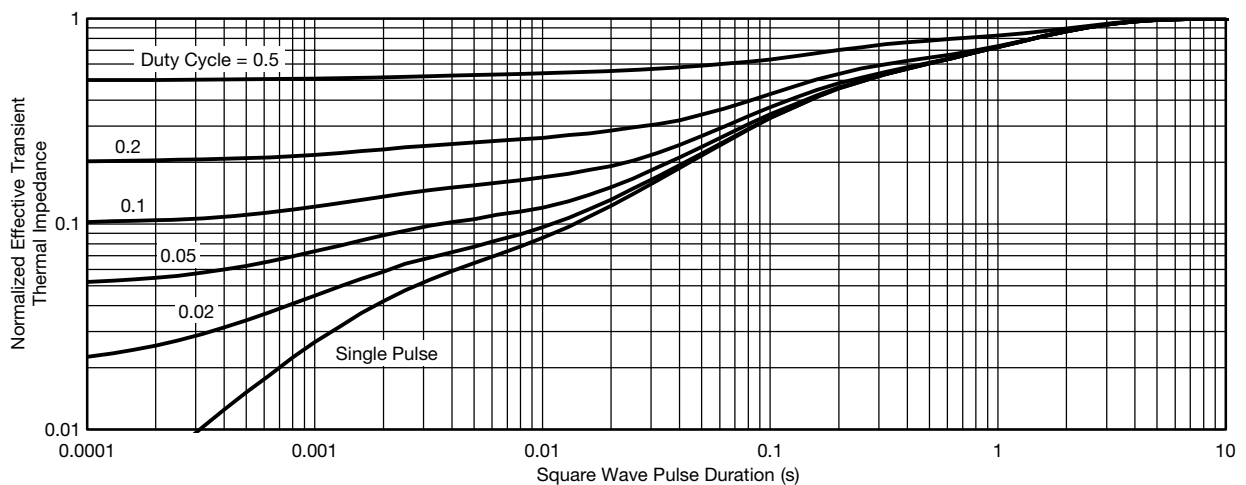
Power, Junction-to-Foot



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot