

PRODUCT SUMMARY						
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω) Typ.	I <sub>D</sub> (A)	Q <sub>g</sub> (Typ.)			
30	0.004 at V <sub>GS</sub> = 4.5 V	60	33.5 nC			
50	0.005 at $V_{GS}$ = 2.5 V	50	33.3110			





- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET<sup>®</sup> Power MOSFET
- •
- 100 % R<sub>g</sub> and UIS Tested Compliant to RoHS Directive 2002/95/EC •

#### **APPLICATIONS**

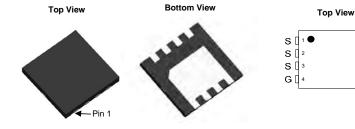
- Motor Control
- Industrial
- Load Switch
- ORing

8 D

7 D

6 D

5 D



# G ŝ N-Channel MOSFET

ABSOLUTE MAXIMUM RATIN Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V <sub>DS</sub>	30	V	
Gate-Source Voltage		V <sub>GS</sub>	± 20		
Continuous Drain Current (T <sub>J</sub> = 150 °C)	$T_{C} = 25 °C$ $T_{C} = 70 °C$ $T_{A} = 25 °C$ $T_{A} = 70 °C$	- I <sub>D</sub>	60 <sup>a, e</sup> 40 <sup>a, e</sup> 22 <sup>b, c</sup> 15 <sup>b, c</sup>		
Pulsed Drain Current (t = 300 µs)		I <sub>DM</sub>	150	A	
Continuous Source-Drain Diode Current	T <sub>C</sub> = 25 °C T <sub>A</sub> = 25 °C	I <sub>S</sub>	35 3.3 <sup>b, c</sup>	1	
Single Pulse Avalanche Current L = 0.1 mH		I <sub>AS</sub>	20	1	
Single Pulse Avalanche Energy	L = 0.1 mm	E <sub>AS</sub>	20	mJ	
Maximum Power Dissipation $T_{C} = 25 ^{\circ}C$ $T_{C} = 70 ^{\circ}C$ $T_{A} = 25 ^{\circ}C$ $T_{A} = 70 ^{\circ}C$		P <sub>D</sub>	52 33 3.7 <sup>b, c</sup> 2.4 <sup>b, c</sup>	w	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150	°C	
Soldering Recommendations (Peak Temperature)			260		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>b, d</sup>	t ≤ 10 s	R <sub>thJA</sub>	24	33	°C/W	
Maximum Junction-to-Case (Drain)	Steady State	R <sub>thJC</sub>	1.9	2.4		

Notes:

a. Based on  $T_C = 25 \text{ °C}$ . b. Surface mounted on 1" x 1" FR4 board.

c. t = 10 s. d. Maximum under steady state conditions is 90 °C/W.

e. Calculated based on maximum junction temperature. Package limitation current is 80 A.





<b>SPECIFICATIONS</b> ( $T_J = 25 \degree C$				1			
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static						-	
Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{GS}$ = 0 V, I <sub>D</sub> = 250 µA	30			V	
V <sub>DS</sub> Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I <sub>D</sub> = 250 μA		30		mV/°C	
V <sub>GS(th)</sub> Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	10 - 200 μΛ		- 5.6			
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}$ , $I_D = 250 \ \mu A$	0.5		1.5	V	
Gate-Source Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
	I <sub>DSS</sub>	$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1	μΑ	
Zero Gate Voltage Drain Current		$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 55 ^{\circ}\text{C}$			10		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	30			Α	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10 A		0.0040		-	
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = 2.5 \text{ V}, \text{ I}_{D} = 7 \text{ A}$		0.0050		Ω	
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 10 A		65		S	
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			6000		pF	
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz		406			
Reverse Transfer Capacitance	C <sub>rss</sub>			360			
		V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A		68	102	- nC	
Total Gate Charge	Qg			33.5	51		
Gate-Source Charge	Q <sub>gs</sub>	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 10 \text{ A}$		7.7			
Gate-Drain Charge	Q <sub>gd</sub>			13.8			
Gate Resistance	R <sub>g</sub>	f = 1 MHz	0.3	0.7	1.4	Ω	
Turn-On Delay Time	t <sub>d(on)</sub>			24	45		
Rise Time	t <sub>r</sub>	$V_{DD}$ = 15 V, $R_L$ = 1.5 $\Omega$		24	45	-	
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong 10 \text{ A}, \text{ V}_{\text{GEN}} = 4.5 \text{ V}, \text{ R}_{\text{g}} = 1 \Omega$		32	60		
Fall Time	t <sub>f</sub>			12	24		
Turn-On Delay Time	t <sub>d(on)</sub>			14	28	ns	
Rise Time	t <sub>r</sub>	$V_{DD} = 15 \text{ V}, \text{ R}_{\text{I}} = 1.5 \Omega$		13	26	-	
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong 10 \text{ A}, \text{ V}_{\text{GEN}} = 10 \text{ V}, \text{ R}_{\text{g}} = 1 \Omega$		33	60		
Fall Time	t <sub>f</sub>			8	16		
Drain-Source Body Diode Characterist				I	I		
Continuous Source-Drain Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25 °C		35			
Pulse Diode Forward Current	I <sub>SM</sub>	~		70		A	
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 3 A, V <sub>GS</sub> = 0 V		0.7	1.1	V	
Body Diode Reverse Recovery Time	t <sub>rr</sub>			21	40	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			10	20	nC	
Reverse Recovery Fall Time	t <sub>a</sub>	$I_F = 10 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, \text{ T}_J = 25 ^\circ\text{C}$		9			
Reverse Recovery Rise Time t <sub>b</sub>				12		ns	
lotes:	°D					L	

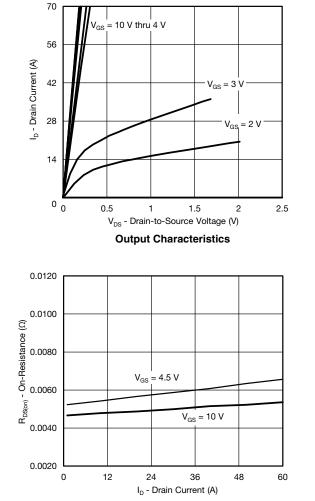
Notes:

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

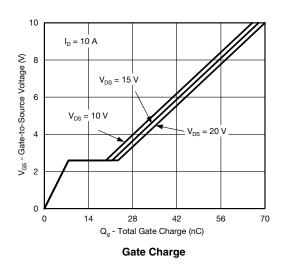
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

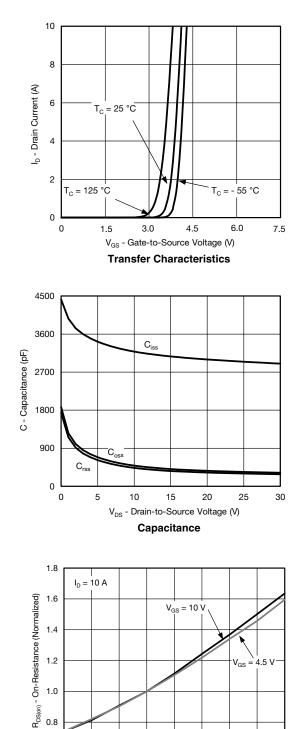
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**On-Resistance vs. Drain Current and Gate Voltage** 

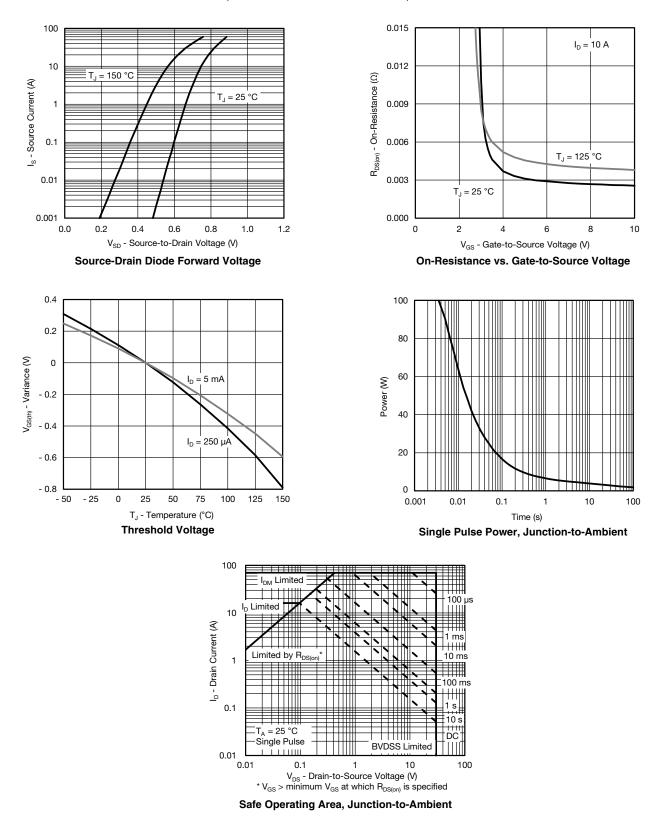




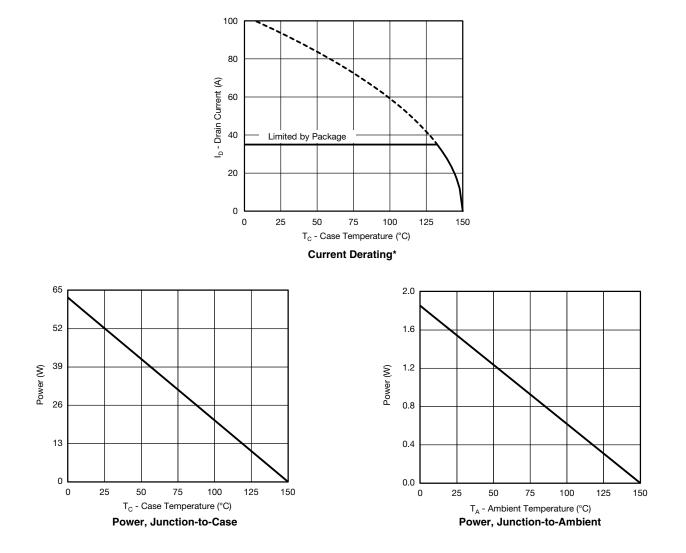
0.6 - 50 - 25 0 25 50 75 100 125 150 T<sub>J</sub> - Junction Temperature (°C)

**On-Resistance vs. Junction Temperature** 



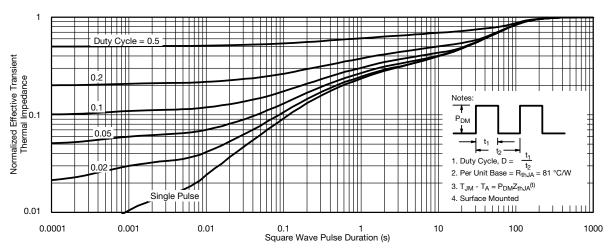


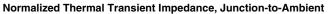


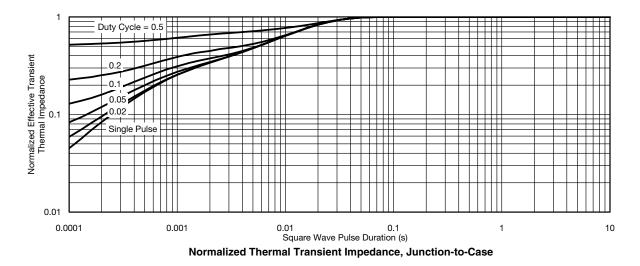


\* The power dissipation  $P_D$  is based on  $T_{J(max.)} = 150$  °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

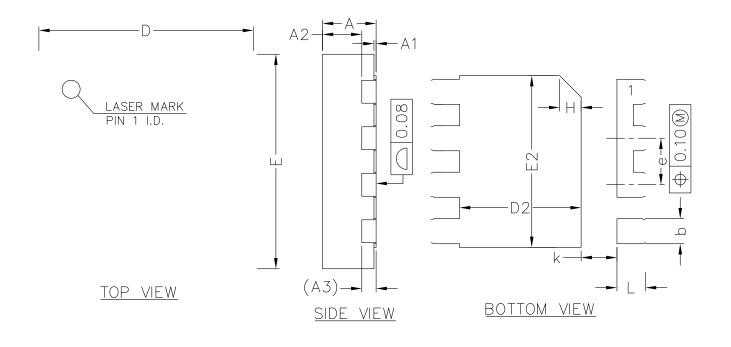








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<u>SIDE VIEW</u>

SYMBOL	MIN	NOM	MAX		
А	0.70	0.75	0.80		
A1	0.00	0.02	0.05		
A2	0.50	0.55	0.60		
A3	0.20REF				
b	0.30	0.35	0.40		
D	2.90	3.00	3.10		
E	2.90	3.00	3.10		
D2	1.60	1.70	1.80		
E2	2.30	2.40	2.50		
е	0.55	0.65	0.75		
Κ	0.40	0.50	0.60		
L	0.35	0.40	0.45		

## COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)



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