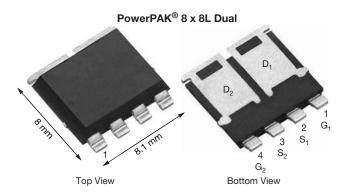


Vishay Siliconix

Automotive Dual N-Channel 60 V (D-S) 175 °C MOSFET



PRODUCT SUMMARY				
V _{DS} (V)	60			
$R_{DS(on)}(\Omega)$ at $V_{GS} = 10 \text{ V}$	0.009			
$R_{DS(on)}$ (Ω) at $V_{GS} = 4.5 \text{ V}$	0.013			
I _D (A) per leg	63			
Configuration	Dual			
Package	PowerPAK 8 x 8L			

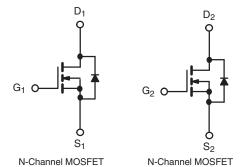
FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_q and UIS tested
- Fully lead (Pb)-free device
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912





ROHS COMPLIANT HALOGEN FREE



ABSOLUTE MAXIMUM RATING	iS (1 _C = 25 °C, unless	otherwise noted)		
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-source voltage		V _{DS}	60		
Gate-source voltage		V _{GS} ± 20		V	
Continuous drain current	T _C = 25 °C ^a	1	63		
	T _C = 125 °C	l _D	36		
Continuous source current (diode conduction) ^a		I _S	50	Α	
Pulsed drain current ^b		I _{DM}	200		
Single pulse avalanche current	L = 0.1 mH	I _{AS}	26		
Single pulse avalanche energy	L=0.1111H	E _{AS}	34	mJ	
Maximum power dissipation ^b	T _C = 25 °C	D	71	W	
	T _C = 125 °C	P_{D}	24		
Operating junction and storage temperature range		T _J , T _{stg}	-55 to +175	°C	
Soldering recommendations (peak temperature) d, e			260	,	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	LIMIT	UNIT	
Junction-to-ambient	PCB mount c	R_{thJA}	75	°C/W	
Junction-to-case (drain)	ion-to-case (drain)		2.1	C/VV	

Notes

- a. Package limited
- b. Pulse test; pulse width \leq 300 μ s, duty cycle \leq 2 %
- c. When mounted on 1" square PCB (FR4 material)
- d. See solder profile (www.vishay.com/doc?73257). The PowerPAK 8 x 8L is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components



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PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-source breakdown voltage	V _{DS}	$V_{GS} = 0$, $I_D = 250 \mu A$		60	-	-	V	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =	$V_{DS} = V_{GS}, I_D = 250 \mu A$		2	2.5		
Gate-source leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$		-	-	± 100	nA	
Zero gate voltage drain current		$V_{GS} = 0 V$	V _{DS} = 20 V	-	-	1		
	I _{DSS}	V _{GS} = 0 V	V _{DS} = 60 V, T _J = 125 °C	-	-	50	μA	
		V _{GS} = 0 V	V _{DS} = 60 V, T _J = 175 °C	-	-	150		
On-state drain current a	I _{D(on)}	V _{GS} = 10 V	$V_{DS} \ge 5 \text{ V}$	40	-	-	Α	
Drain-source on-state resistance ^a		V _{GS} = 10 V	I _D = 10 A	-	0.0070	0.0090	Ω	
	Б	V _{GS} = 4.5 V	I _D = 7 A	-	0.0092	0.0130		
	R _{DS(on)}	V _{GS} = 10 V	I _D = 10 A, T _J = 125 °C	-	-	0.0145		
		V _{GS} = 10 V	I _D = 10 A, T _J = 175 °C	-	-	0.0180		
Forward transconductance b	9fs	V _{DS} = 15 V, I _D = 10 A		-	55	-	S	
Dynamic ^b								
Input capacitance	C _{iss}		V _{DS} = 25 V, f = 1 MHz	-	1560	1950	pF	
Output capacitance	C _{oss}	$V_{GS} = 0 V$		-	771	964		
Reverse transfer capacitance	C _{rss}			-	87	108		
Total gate charge ^c	Qg	V _{GS} = 10 V V _{DS} = 30 V, I _D = 10 A		-	19	24		
Gate-source charge ^c	Q _{gs}		-	4	-	nC		
Gate-drain charge ^c	Q_{gd}			-	2	-		
Gate resistance	R _g	f = 1 MHz		0.98	1.6	2.6	Ω	
Turn-on delay time ^c	t _{d(on)}	$V_{DD} = 30 \text{ V, } R_L = 4 \Omega$ $I_D \cong 10 \text{ A, } V_{GEN} = 10 \text{ V, } R_g = 1 \Omega$		-	10	14	ns	
Rise time ^c	t _r			-	3	5		
Turn-off delay time ^c	t _{d(off)}			-	22	28		
Fall time ^c	t _f			-	3	5		
Source-Drain Diode Ratings and Char	acteristics b							
Pulsed current ^a	I _{SM}			-	-	200	Α	
Forward voltage	V_{SD}	$I_F = 20 \text{ A}, V_{GS} = 0$		-	1	1.2	V	

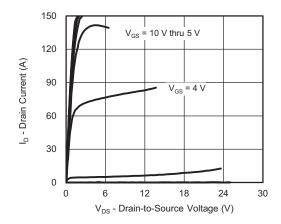
Notes

- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%$
- b. Guaranteed by design, not subject to production testing
- c. Independent of operating temperature

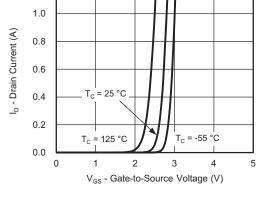
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

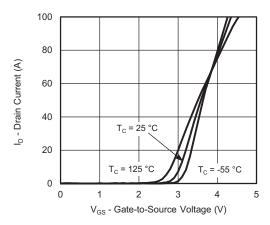


Output Characteristics

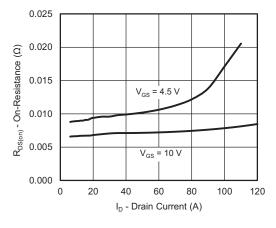


1.2

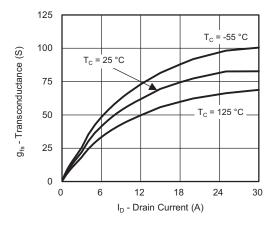
Transfer Characteristics



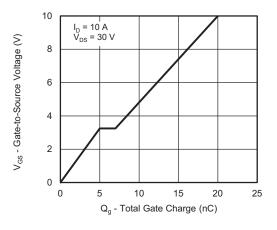
Transfer Characteristics



On-Resistance vs. Drain Current



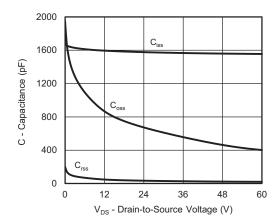
Transconductance



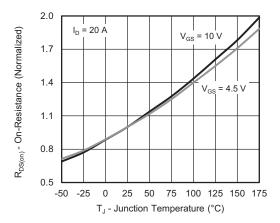
Gate Charge



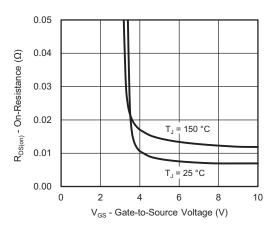
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



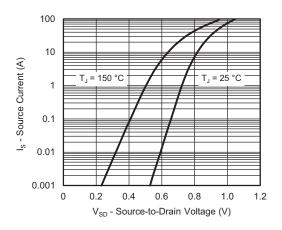
Capacitance



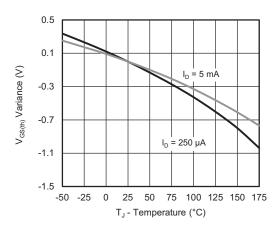
On-Resistance vs. Junction Temperature



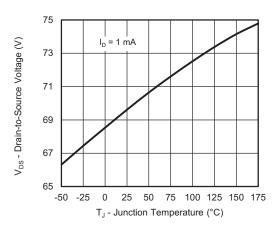
On-Resistance vs. Gate-to-Source Voltage



Source Drain Diode Forward Voltage



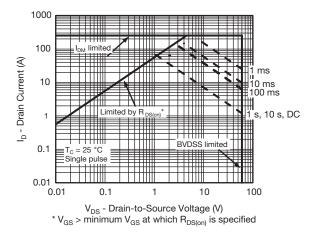
Threshold Voltage



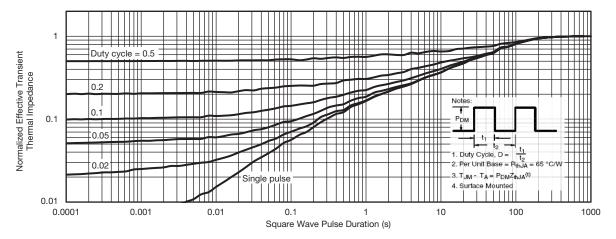
Drain Source Breakdown vs. Junction Temperature



THERMAL RATINGS ($T_A = 25$ °C, unless otherwise noted)



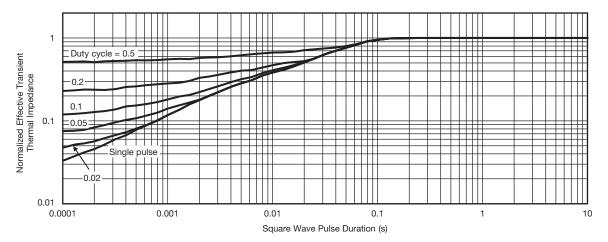
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction to Ambient (25 °C)
 - Normalized Transient Thermal Impedance Junction to Case (25 °C)

are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg276020.



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