

F1010EZL-VB TO262F Datasheet N-Channel 60 V (D-S) MOSFET

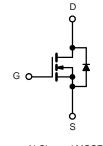
PRODUCT SUMMARY				
V _{DS} (V)	R _{DS(on)} (Ω) I _D (A			
60 -	0.003 at V _{GS} = 10 V	210		
	0.005 at V _{GS} = 4.5 V	185		

FEATURES

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







N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_{C} =	25 °C, unless othe	rwise noted)			
Parameter		Symbol	Limit	Unit	
Gate-Source Voltage		V _{GS}	± 20	V	
Continuous Drain Current (T _{.1} = 175 °C) ^b	T _C = 25 °C	I _D	210		
Continuous Drain Current $(T_J = 175 °C)^{*}$	T _C = 100 °C	D	185 ^a		
Pulsed Drain Current		I _{DM}	200	A	
Continuous Source Current (Diode Conduction)		۱ _S	180 ^a		
Avalanche Current		I _{AS}	70	1	
Single Avalanche Energy (Duty Cycle \leq 1 %)	L = 0.1 mH	E _{AS}	125	mJ	
Maximum Dawar Discinction	T _C = 25 °C	Pn	136	w	
Maximum Power Dissipation	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 lunction to Ambienta	$t \le 10 \text{ sec}$	- R _{thJA}	15	18	°C/W
Maximum Junction-to-Ambient ^a	Steady State		40	50	
Maximum Junction-to-Case		R _{thJC}	0.85	1.1	

Notes:

a. Package limited.

b. Surface mounted on 1" x 1" FR4 board.

c. $t \le 10$ s.

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Baramatar	Symbol	Test Conditions	Min.	T a	Max.	Unit	
Parameter	Symbol	Test Conditions	win.	Typ. ^a	wax.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, \text{ I}_{D} = 250 \mu\text{A}$	60			V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1	2	3		
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
Zero Gate Voltage Drain Current		$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA	
	I _{DSS}	$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 125 \text{ °C}$			50		
		V_{DS} = 60 V, V_{GS} = 0 V, T_{J} = 175 °C			250		
On-State Drain Current ^b	I _{D(on)}	$V_{DS} = 5 V, V_{GS} = 10 V$	60			А	
		$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 20 \text{ A}$		0.003			
	D	V_{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.008		Ω	
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.010			
		V _{GS} = 4.5 V, I _D = 15 A		0.005			
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic							
Input Capacitance	C _{iss}			2650			
Output Capacitance	C _{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		470		pF	
Reverse Transfer Capacitance	C _{rss}			225			
Total Gate Charge ^c	Qg			47	70		
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 30 V, V_{GS} = 10 V, I_{D} = 50 A		10		nC	
Gate-Drain Charge ^c	Q _{gd}			12			
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R _L = 0.6 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _g = 2.5 Ω		15	25	ns	
Turn-Off Delay Time ^c	t _{d(off)}			35	50		
Fall Time ^c	t _f	-		20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)					
Pulsed Current	I _{SM}				60	А	
Diode Forward Voltage	V _{SD}	I _F = 20 A, V _{GS} = 0 V		1	1.5	V	
Didue i diwalu voltage	• 50	F = 2070, 000 = 000			1.5	v	

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

Notes:

a. For design aid only; not subject to production testing.

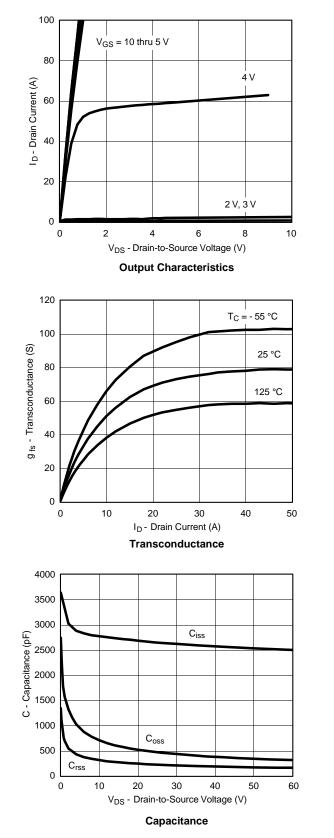
b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

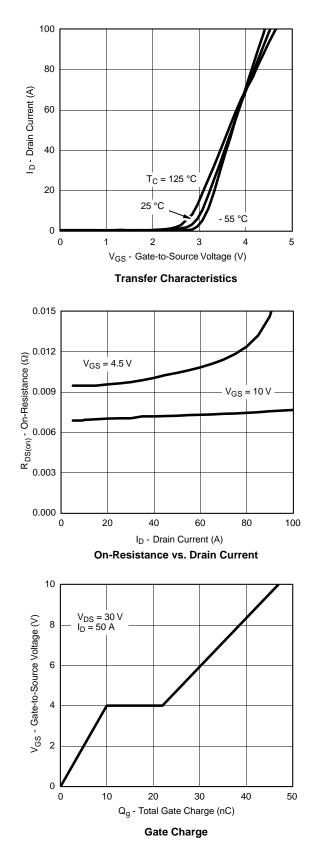
c. Independent of operating temperature.

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.



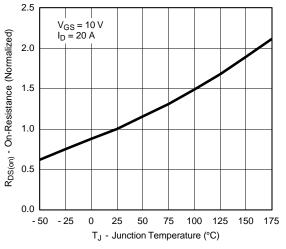
TYPICAL CHARACTERISTICS (25 °C unless noted)



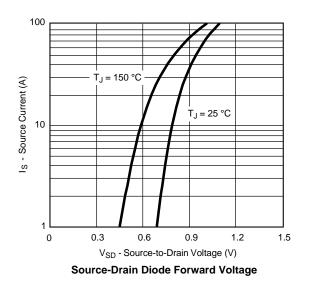




TYPICAL CHARACTERISTICS (25 °C unless noted)



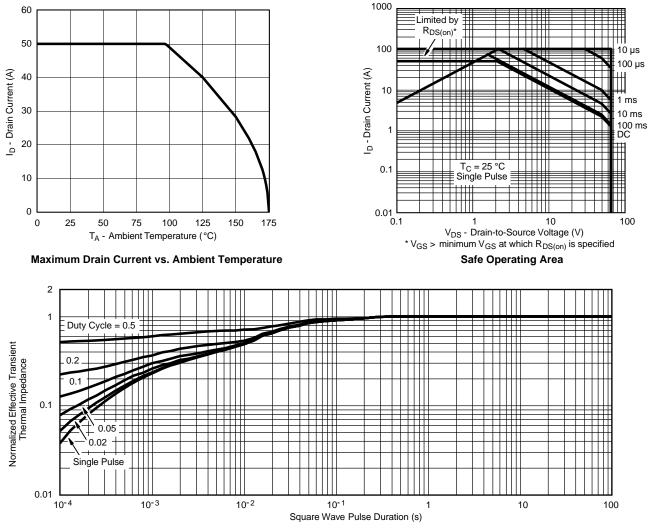
On-Resistance vs. Junction Temperature



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THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Case



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