

850V Depletion-Mode Power MOSFET

General Features

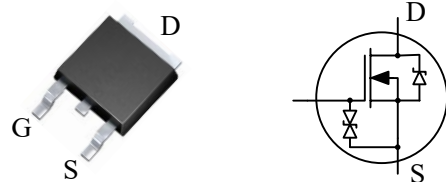
- Depletion Mode (Normally On)
- ESD Improved Capability
- Fast Switching Speed
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(ON)(TYP.)}$	I_{DSS}
850V	15 Ω	400mA

Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

TO-252



Ordering Information

Part Number	Package	Marking	Remark
DMD8515E	TO-252	8515	Halogen Free

Absolute Maximum Ratings

$T_A=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	DMD8515E	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	850	V
I_D	Continuous Drain Current	0.4	A
I_{DM}	Pulsed Drain Current ^[2]	1.6	
P_D	Power Dissipation	36	W
V_{GS}	Gate-to-Source Voltage	± 20	V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	$^{\circ}\text{C}$
T_J and T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	DMD8515E	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.47	K/W

Electrical Characteristics

OFF Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	850	--	--	V	$V_{GS} = -10\text{V}$, $I_D = 250\mu\text{A}$
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	10	μA	$V_{DS} = 850\text{V}$, $V_{GS} = -10\text{V}$
I_{GSS}	Gate-to-Source Leakage Current	--	--	± 20	μA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$

ON Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
I_{DSS}	Saturated Drain-to-Source Current	400	--	--	mA	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	15	30	Ω	$V_{GS} = 0\text{V}$, $I_D = 200\text{mA}$ ^[3]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-1.8	--	-4.0	V	$V_{DS} = 9\text{V}$, $I_D = 20\mu\text{A}$
gfs	Forward Transconductance	--	--	--	S	$V_{DS} = 20\text{V}$, $I_D = 200\text{mA}$

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	--	--	pF	$V_{GS} = -10\text{V}$ $V_{DS} = 50\text{V}$ $f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	--	--	--		
C_{rss}	Reverse Transfer Capacitance	--	--	--		
Q_g	Total Gate Charge	--	--	--	nC	$V_{GS} = -10\text{V} \sim 5\text{V}$ $V_{DS} = 150\text{V}$, $I_D = 200\text{mA}$
Q_{gs}	Gate-to-Source Charge	--	--	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	--	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	--	--	ns	$V_{GS} = -10\text{V} \sim 0\text{V}$ $V_{DD} = 50\text{V}$, $I_D = 200\text{mA}$ $R_G = 10\Omega$
t_{rise}	Rise Time	--	--	--		
$t_{d(off)}$	Turn-off Delay Time	--	--	--		
t_{fall}	Fall Time	--	--	--		



Source-Drain Diode Characteristics

$T_A=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	$I_{SD}=200\text{mA}$, $V_{GS}=-10\text{V}$

NOTE:

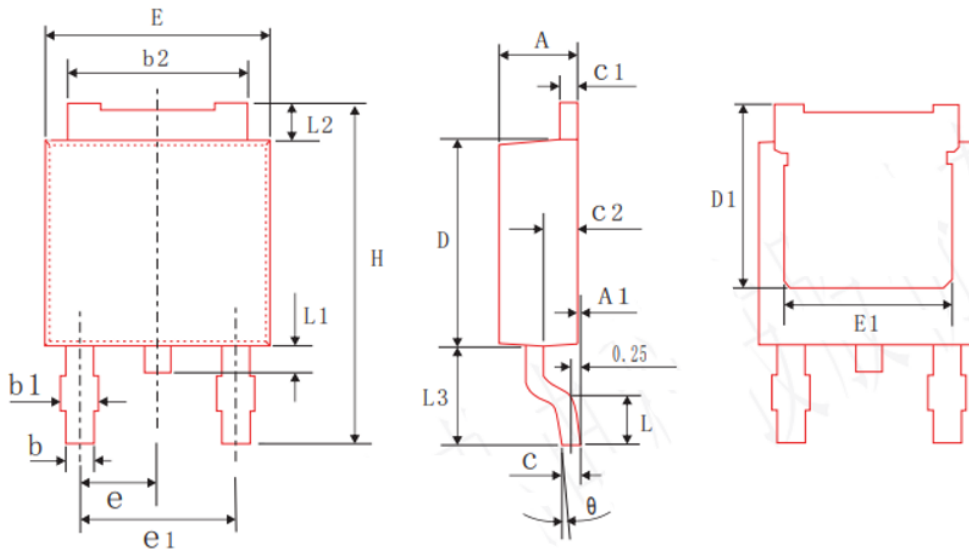
[1] $T_J=+25^{\circ}\text{C}$ to $+150^{\circ}\text{C}$

[2] Repetitive rating, pulse width limited by maximum junction temperature.

[3] Pulse width $\leq 380\mu\text{s}$; duty cycle $\leq 2\%$.

Package Dimensions

TO-252



SYMBOL	MIN	NOM	MAX
A	2.2	2.3	2.4
A1	0.00	0.05	0.10
b	0.762	0.812	0.862
b1	--	--	1.10
b2	5.23	5.33	5.43
c	0.458	1.508	0.558
c1	0.458	0.508	0.558
c2	0.80	1.00	1.20
D	6.00	6.10	6.20
D1	5.25	5.45	5.65
H	10.00	10.10	10.20
E	6.50	6.60	6.70
E1	4.75	4.85	4.95
e1	4.37	4.57	4.77
L	--	--	1.45
L1	0.60	0.75	0.90
L2	0.90	1.10	1.30
L3	2.80	3.00	3.20
θ	0°	4°	8°
e	2.285 BSC		



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