

Dual Integrated Circuit

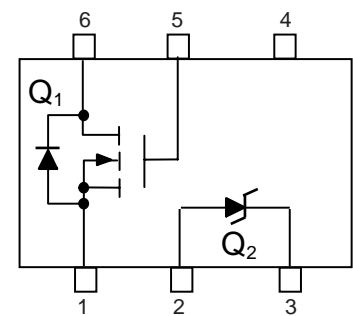
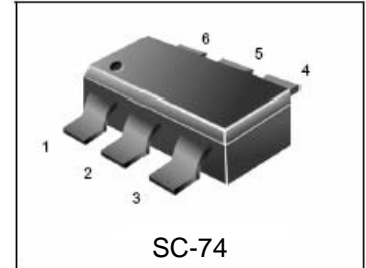
N-Channel/PN Duals

- We declare that the material of product compliance with RoHS requirements.

MAXIMUM RATING

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	50	Vdc
Gate-to-Source Voltage – Continuous	V_{GS}	± 20	Vdc
Drain Current			mA
– Continuous @ $T_A = 25^\circ\text{C}$	I_D	200	
– Pulsed Drain Current ($t_p \leq 10 \mu\text{s}$)	I_{DM}	800	
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	225	mW
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$
Thermal Resistance – Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	T_L	260	$^\circ\text{C}$

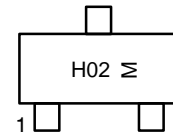
LBS138V3.3T1G



ORDERING INFORMATION

Device	Marking	Shipping
LBS138V3.3T1G	H02	3000/Tape&Reel
LBS138V3.3T3G	H02	10000/Tape&Reel

MARKING DIAGRAM



H02 = Device Code

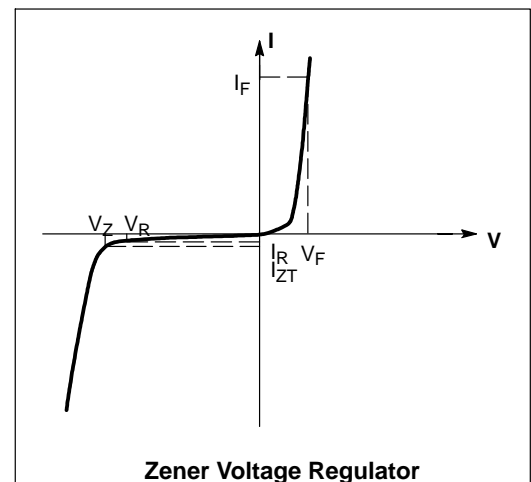
M = Month Code

ELECTRICAL CHARACTERISTICS (Q2)

($T_A = 25^\circ\text{C}$ unless otherwise noted,

$V_F = 0.9 \text{ V Max. @ } I_F = 10 \text{ mA}$ for all types)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F
Θ_{VZ}	Maximum Temperature Coefficient of V_Z
C	Max. Capacitance @ $V_R = 0$ and $f = 1 \text{ MHz}$



Zener Voltage Regulator

LBS138V3.3T1G

ELECTRICAL CHARACTERISTICS(Q1) $(T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-to-Source Breakdown Voltage ($V_{GS} = 0$ Vdc, $I_D = 250$ μ Adc)	$V_{(BR)DSS}$	50	–	–	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 25$ Vdc, $V_{GS} = 0$ Vdc) ($V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	–	–	0.1 0.5	μ Adc
Gate-Source Leakage Current ($V_{GS} = \pm 20$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}	–	–	± 0.1	μ Adc

ON CHARACTERISTICS (Note 1.)

Gate-Source Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1.0$ mAdc)	$V_{GS(th)}$	0.5	–	1.5	Vdc
Static Drain-to-Source On-Resistance ($V_{GS} = 2.75$ Vdc, $I_D < 200$ mAdc, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$) ($V_{GS} = 5.0$ Vdc, $I_D = 200$ mAdc)	$r_{DS(on)}$	–	5.6	10 3.5	Ohms
Forward Transconductance ($V_{DS} = 25$ Vdc, $I_D = 200$ mAdc, $f = 1.0$ kHz)	g_{fs}	100	–	–	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance	($V_{DS} = 25$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{iss}	–	40	50	pF
Output Capacitance	($V_{DS} = 25$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{oss}	–	12	25	
Transfer Capacitance	($V_{DG} = 25$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{rss}	–	3.5	5.0	

SWITCHING CHARACTERISTICS (Note 2.)

Turn-On Delay Time	(V _{DD} = 30 Vdc, I _D = 0.2 Adc,)	$t_{d(on)}$	–	–	20	ns
Turn-Off Delay Time		$t_{d(off)}$	–	–	20	

1. Pulse Test: Pulse Width ≤ 300 μ s, Duty Cycle $\leq 2\%$.
2. Switching characteristics are independent of operating junction temperature.

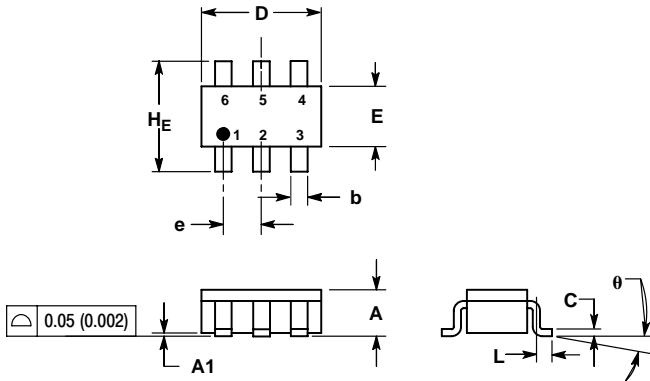
ELECTRICAL CHARACTERISTICS(Q2) $(T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Zener Voltage @ $I_{ZT} = 5\text{mA}$	V_Z (Volts)	3.1	3.3	3.5	V
Maximum Zener Impedance @ $I_{ZT} = 5\text{mA}$	Z_{ZT}			95	Ω
Maximum Zener Impedance @ $I_{ZK} = 0.5\text{mA}$	Z_{ZK}			1000	Ω
Reverse Leakage Current @ $V_R = 1.0\text{V}$	I_R			5	μ A
Forward Voltage @ $I_F = 10\text{mA}$	V_F			0.9	V
Maximum Temperature Coefficient of V_Z $I_{ZT} = 5\text{mA}$	θV_Z	–3.5		0	mV/k
Max. Capacitance @ $V_R = 0, f = 1$ MHz	C		450		pF

2. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C .

LBS138V3.3T1G

SC-74



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	-	10°	0°	-	10°

