

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
60V	2.5Ω@10V	0.3A
	3.0Ω@4.5V	

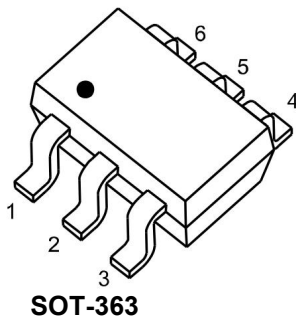
### Feature

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage
- ESD Protection
- Suffix "-Q1" for AEC-Q101

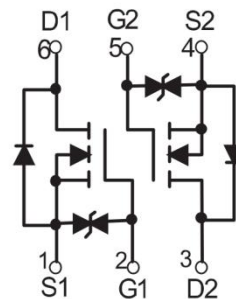
### Application

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

### Package



### Circuit diagram



### Marking



### Absolute maximum ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	0.3	A
Continuous Drain Current( $T_A=70^{\circ}\text{C}$ )	$I_D(70^{\circ}\text{C})$	0.24	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	1.5	A
Power Dissipation	$P_D$	0.3	W
Thermal Resistance from Junction to Ambient <sup>2)</sup>	$R_{\theta JA}$	416	$^{\circ}\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

### Electrical characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 0.3\text{A}$		1.9	2.5	$\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 0.2\text{A}$		2.0	3.0	
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		27		pF
Output Capacitance	$C_{oss}$			3		
Reverse Transfer Capacitance	$C_{rss}$			2		
Total Gate Charge	$Q_g$	$V_{DS} = 30\text{V}, V_{GS} = 10\text{V}, I_D = 0.3\text{A}$		1.65		nC
Gate-Source Charge	$Q_{gs}$			0.5		
Gate-Drain Charge	$Q_{gd}$			0.18		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, I_D = 0.3\text{A}, R_{GEN} = 6\Omega$		6.5		nS
Turn-on rise time	$t_r$			19		
Turn-off delay time	$t_{d(off)}$			9.6		
Turn-off fall time	$t_f$			84		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				0.3	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 0.3\text{A}$			1.2	V
Reverse Recovery Charge	$Q_{rr}$	$V_{GS} = 0\text{V}, I_S = 0.3\text{A}, V_R = 25\text{V}, di/dt = -100\text{A}/\mu\text{s}$		3.6		nC
Reverse Recovery Time	$t_{rr}$			24		nS

Notes:

- 1) Pulse Test: Pulse Width < 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- 2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.
- 3) Guaranteed by design, not subject to production testing.

## Typical Characteristics

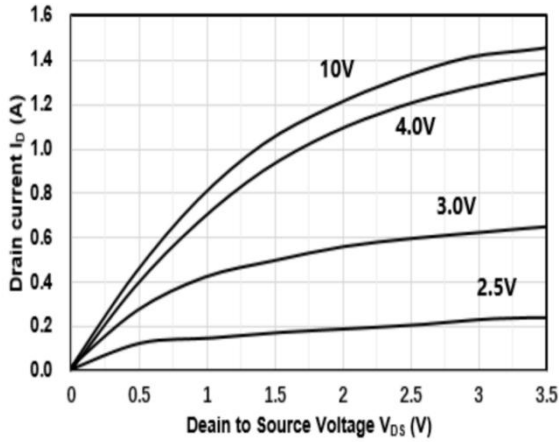


Figure1. Output Characteristics

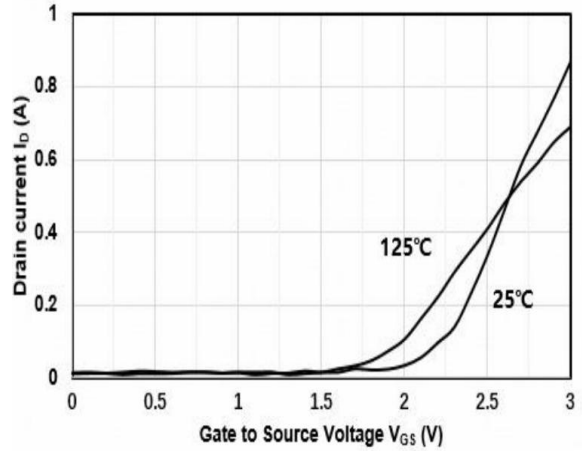


Figure2. Transfer Characteristics

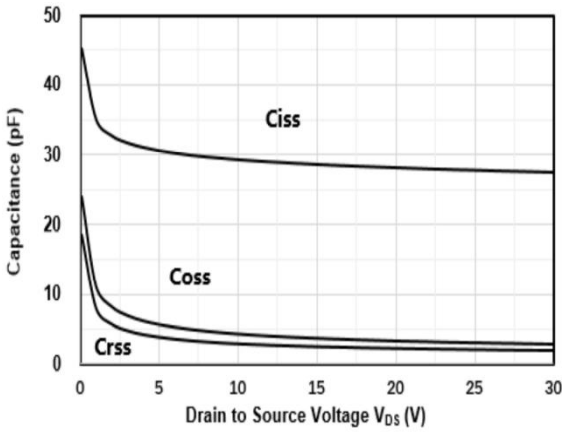


Figure3. Capacitance Characteristics

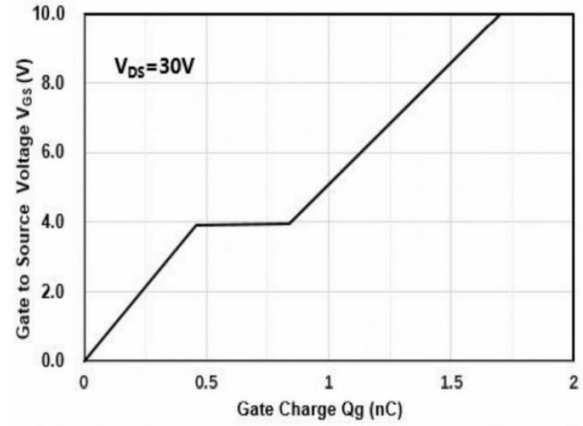


Figure4. Gate Charge

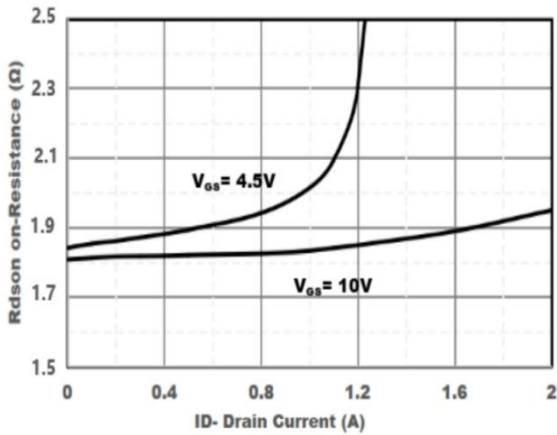


Figure5. Drain-Source on Resistance

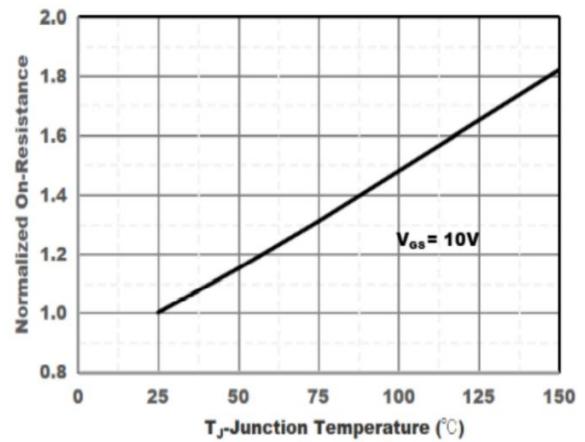


Figure6. Drain-Source on Resistance

## Typical Characteristics

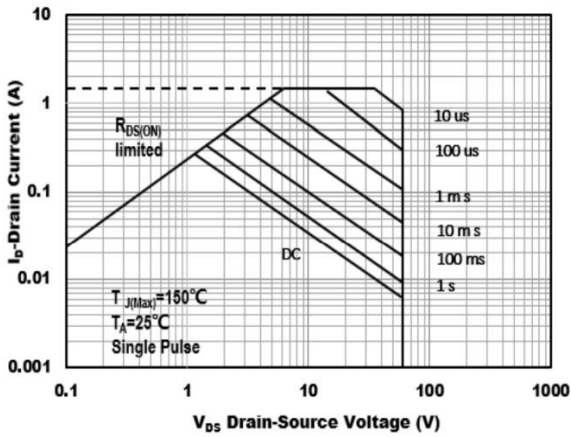


Figure7. Safe Operation Area

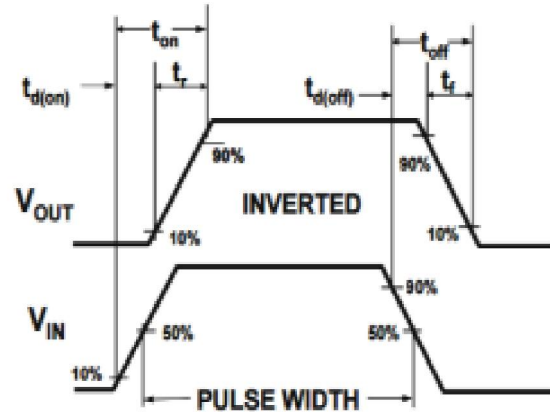


Figure8. Switching wave

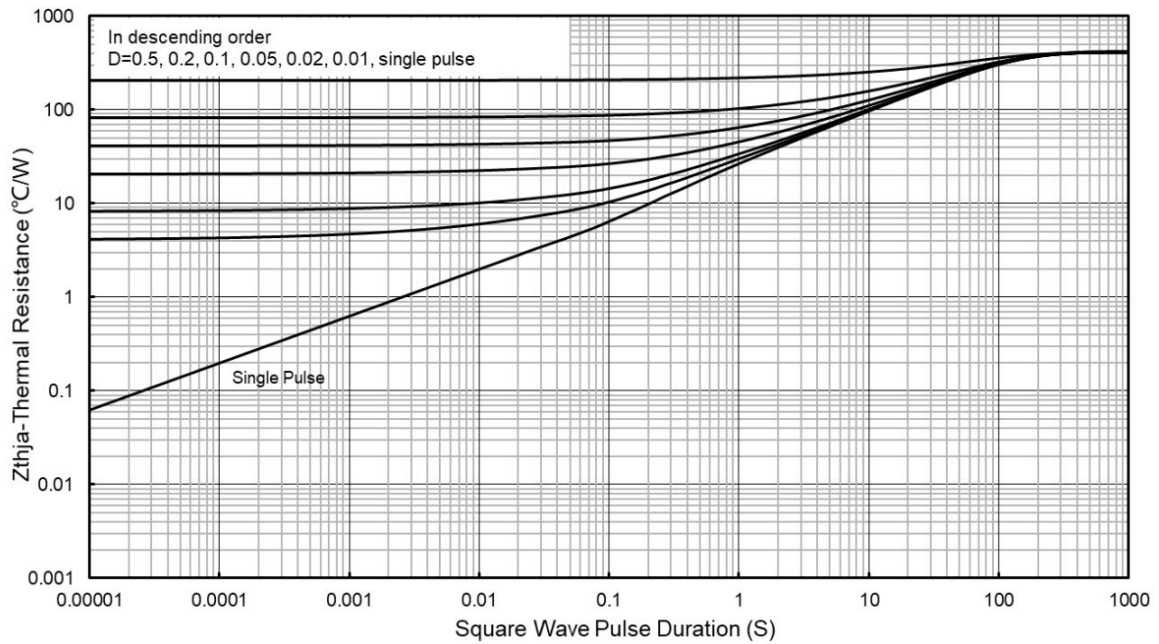
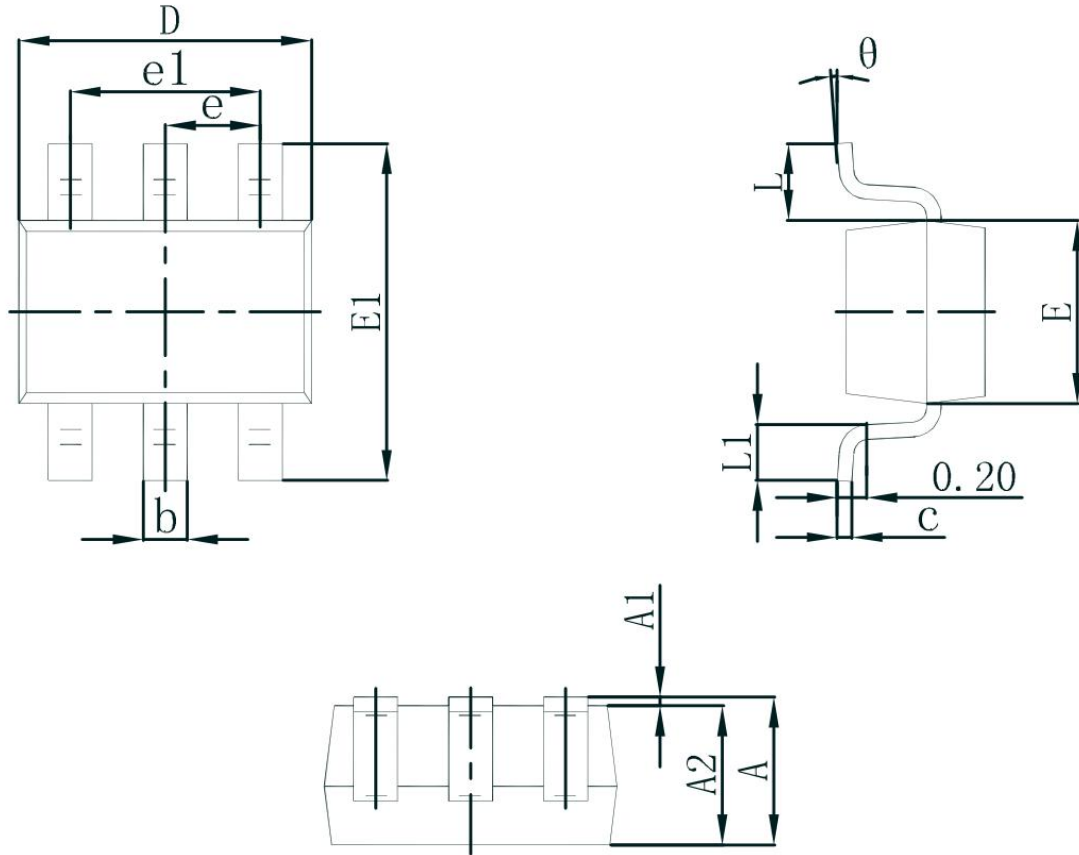


Figure9. Maximum Transient Thermal Impedance

### SOT-363 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.250	0.004	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
$\theta$	0°	8°	0°	8°