

**Features**

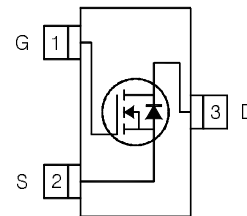
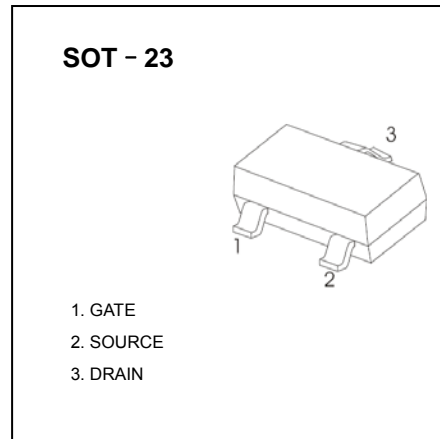
- $V_{DS} = 20V$
- $R_{DS(ON)} < 24m\Omega$  ( $V_{GS} = 4.5V$ )
- $R_{DS(ON)} < 31m\Omega$  ( $V_{GS} = 2.5V$ )

**Application(s)**

- Load/ System Switch

**Benefits**

- Multi-vendor compatibility
- Environmentally friendly
- Increased Reliability



**Absolute Maximum Ratings**

$V_{DS}$	Drain-Source Voltage	20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	6.3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5.1	
$I_{DM}$	Pulsed Drain Current	32	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation	1.3	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation	0.80	
	Linear Derating Factor	0.01	W/ $^\circ C$
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	V
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

**Thermal Resistance**

$R_{\theta JA}$	Junction-to-Ambient <sup>③</sup>	—	100	$^\circ C/W$
$\theta_{JA}$	Junction-to-Ambient ( $t < 10s$ ) <sup>④</sup>	—	99	


**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .
- ③ Surface mounted on 1 in square Cu board.

### Electric Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	20			V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient		7.8		mV/°C	Reference to 25°C, I <sub>D</sub> = 1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance		21	24	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.3A ②
			27	31		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5.1A ②
V <sub>GS(th)</sub>	Gate Threshold Voltage	0.5	0.9	1.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 10μA
I <sub>DSS</sub>	Drain-to-Source Leakage Current			1.0	μA	V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V
				150		V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage			100	nA	V <sub>GS</sub> = 12V
	Gate-to-Source Reverse Leakage			-100		V <sub>GS</sub> = -12V
R <sub>G</sub>	Internal Gate Resistance		1.7		Ω	
g <sub>fs</sub>	Forward Transconductance	17			S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6.3A
Q <sub>g</sub>	Total Gate Charge		8.9		nC	I <sub>D</sub> = 6.3A
Q <sub>gs</sub>	Gate-to-Source Charge		0.68			V <sub>DS</sub> = 10V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge		4.4			V <sub>GS</sub> = 4.5V ②
t <sub>d(on)</sub>	Turn-On Delay Time		4.9		ns	V <sub>DD</sub> = 10V ②
t <sub>r</sub>	Rise Time		7.5			I <sub>D</sub> = 1.0A
t <sub>d(off)</sub>	Turn-Off Delay Time		19			R <sub>G</sub> = 6.8Ω
t <sub>f</sub>	Fall Time		12			V <sub>GS</sub> = 4.5V
C <sub>iss</sub>	Input Capacitance		700		pF	V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance		140			V <sub>DS</sub> = 16V
C <sub>rss</sub>	Reverse Transfer Capacitance		98			f = 1.0MHz

### Source - Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	
I <sub>S</sub>	Continuous Source Current (Body Diode)			1.3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①			32		
V <sub>SD</sub>	Diode Forward Voltage			1.2	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 6.3A, V <sub>GS</sub> = 0V ②
t <sub>rr</sub>	Reverse Recovery Time		12	18	ns	T <sub>J</sub> = 25°C, V <sub>R</sub> = 15V, I <sub>F</sub> = 1.3A
Q <sub>rr</sub>	Reverse Recovery Charge		5.1	7.7	nC	di/dt = 100A/μs ②

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

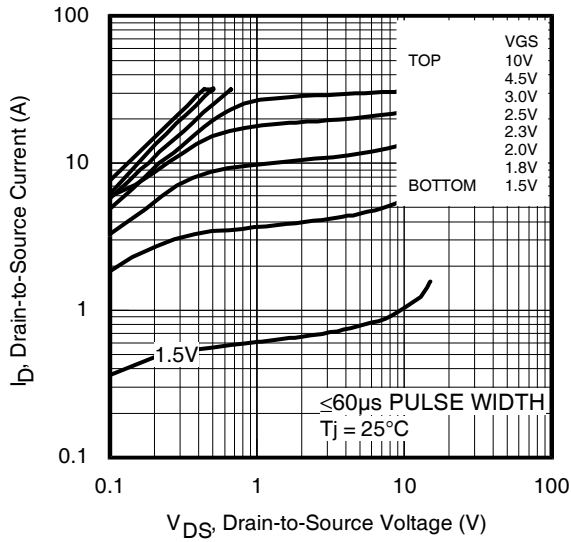


Fig 1. Typical Output Characteristics

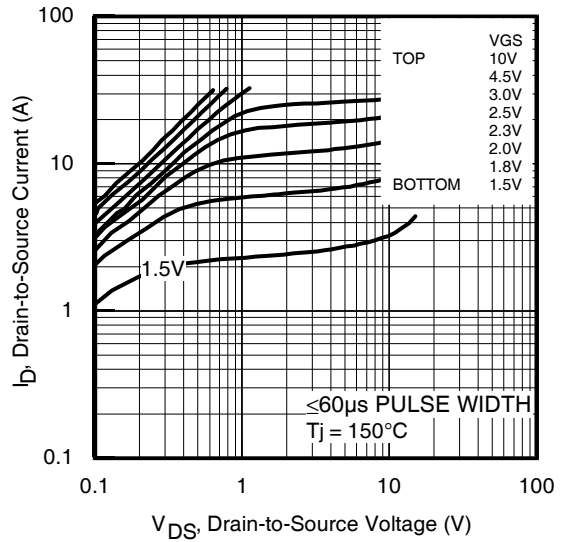


Fig 2. Typical Output Characteristics

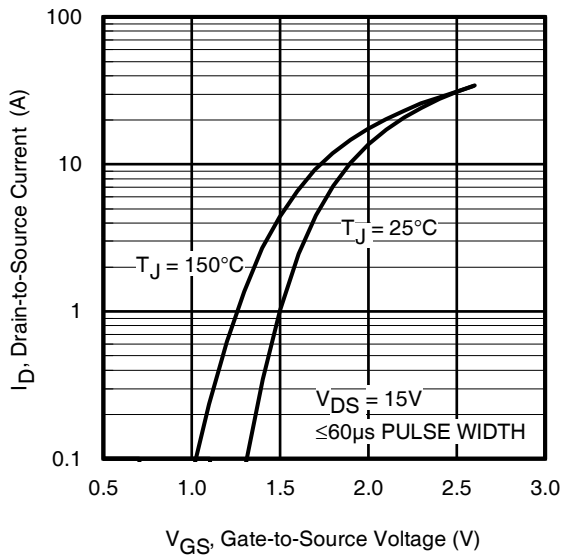


Fig 3. Typical Transfer Characteristics

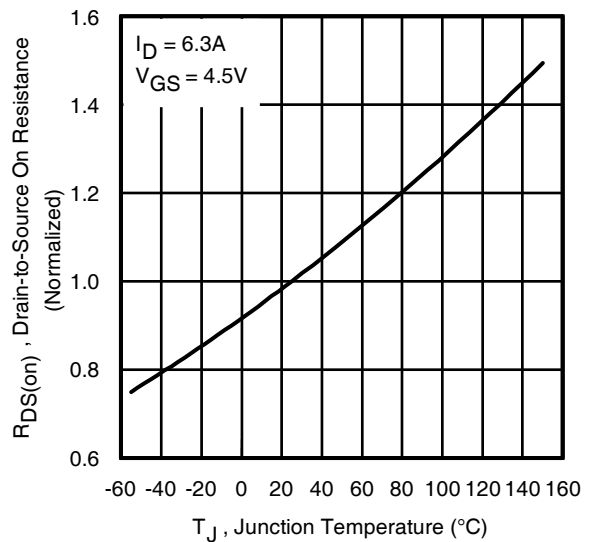


Fig 4. Normalized On-Resistance vs. Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

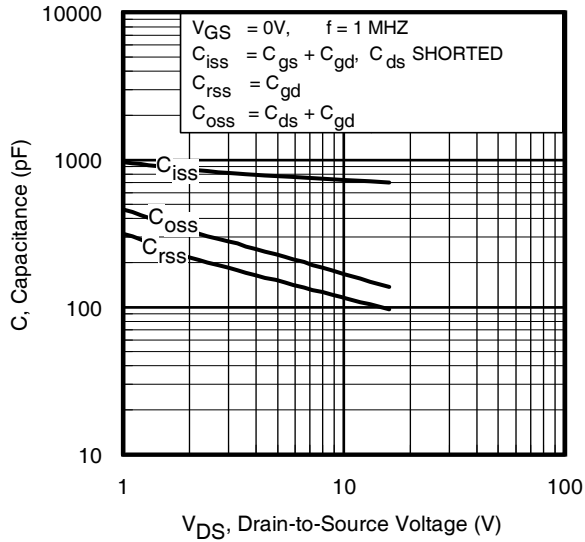


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

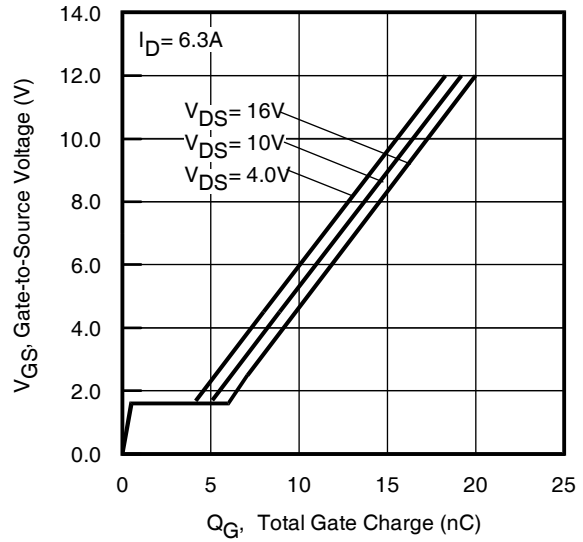


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

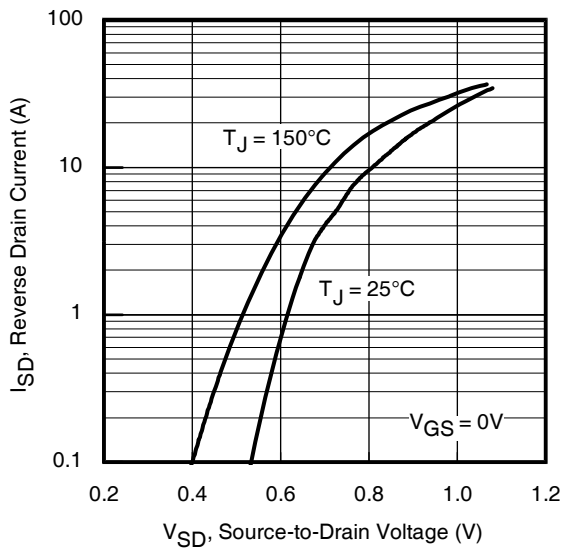


Fig 7. Typical Source-Drain Diode Forward Voltage

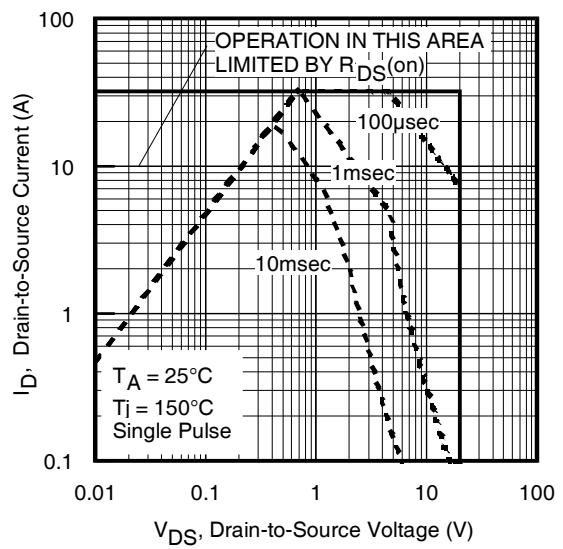
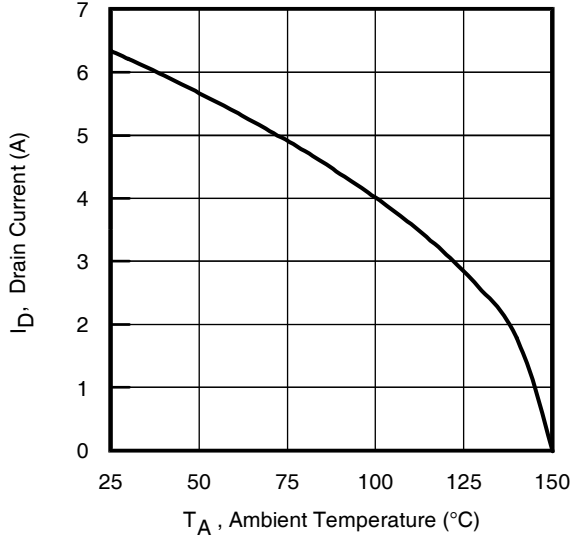
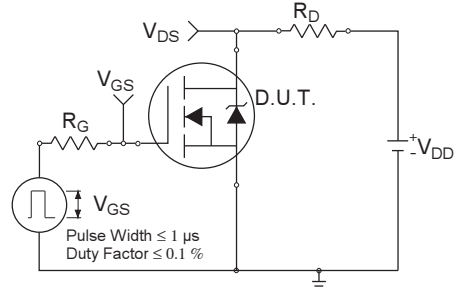


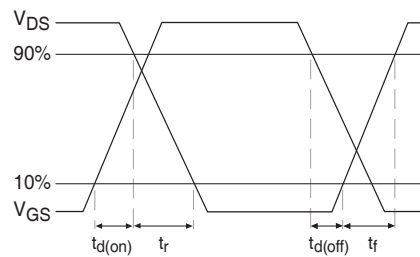
Fig 8. Maximum Safe Operating Area



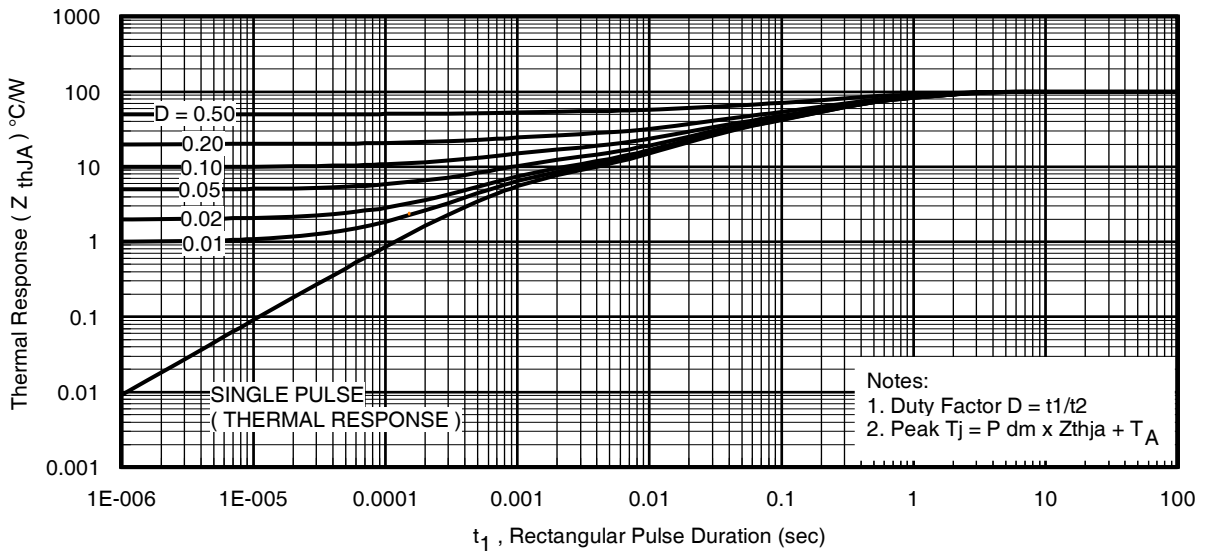
**Fig 9.** Maximum Drain Current vs. Ambient Temperature



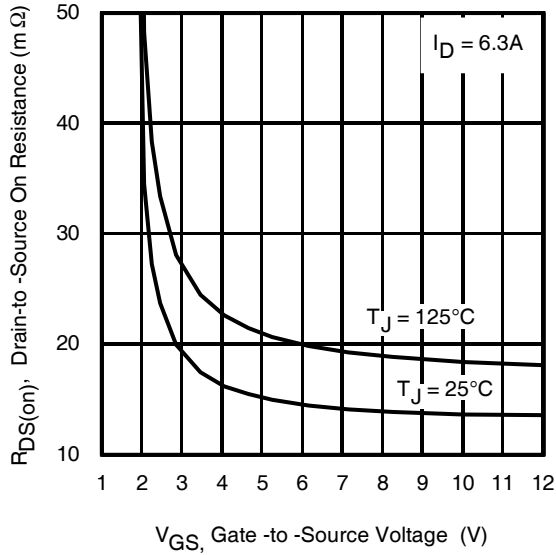
**Fig 10a.** Switching Time Test Circuit



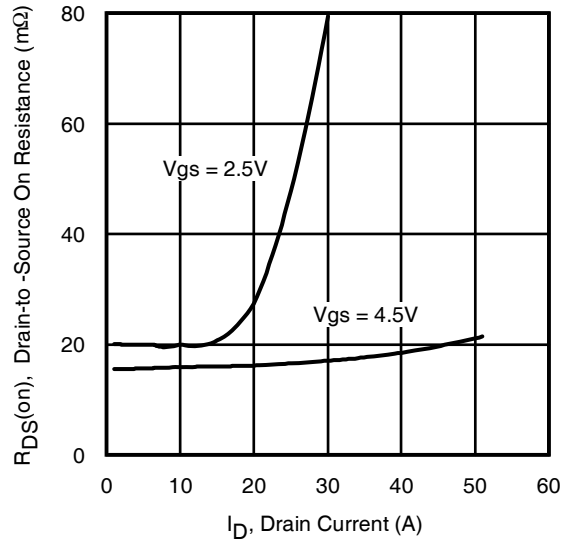
**Fig 10b.** Switching Time Waveforms



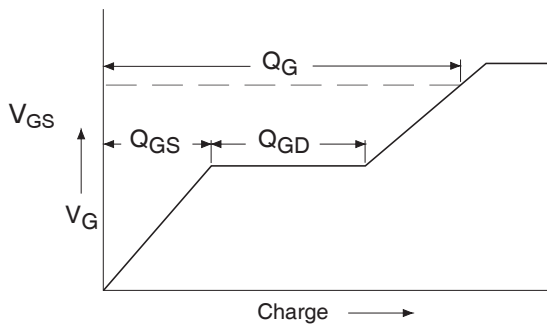
**Fig 11.** Typical Effective Transient Thermal Impedance, Junction-to-Ambient



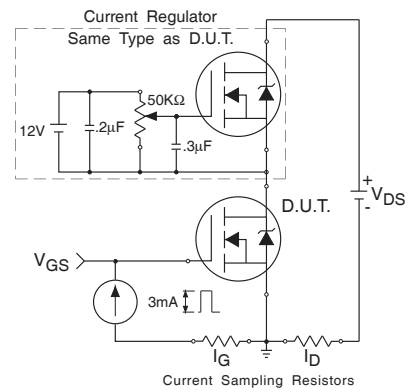
**Fig 12.** Typical On-Resistance vs. Gate Voltage



**Fig 13.** Typical On-Resistance vs. Drain Current



**Fig 14a.** Basic Gate Charge Waveform



**Fig 14b.** Gate Charge Test Circuit

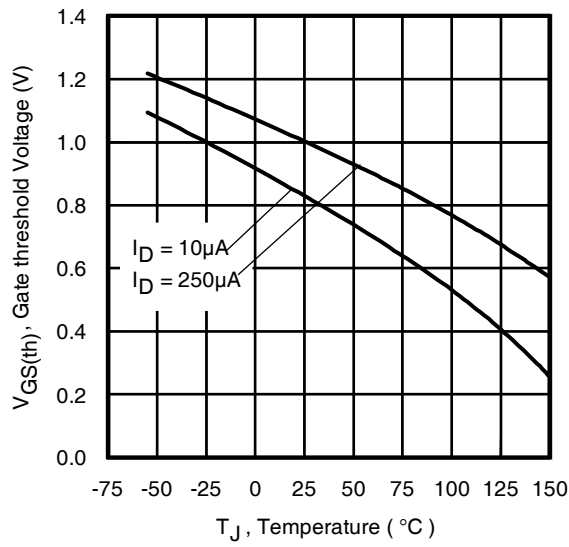


Fig 15. Typical Threshold Voltage vs. Junction Temperature

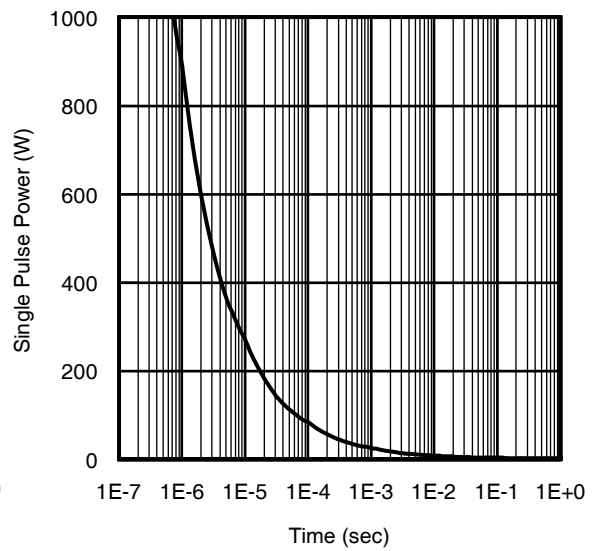
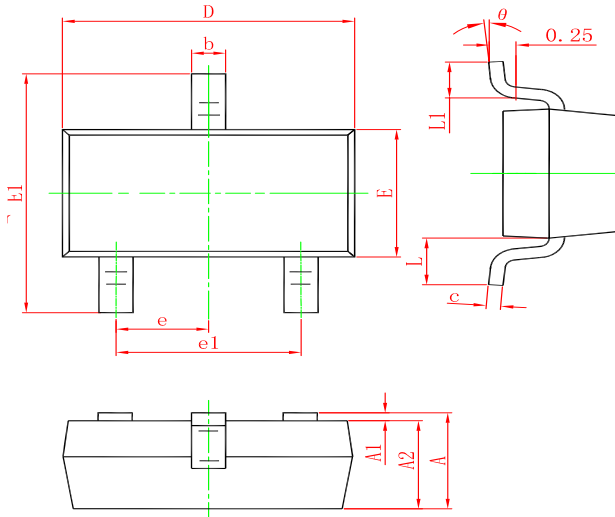


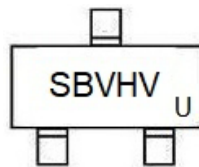
Fig 16. Typical Power vs. Time

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IRLML6244TR	SOT-23	3000	Tape and reel