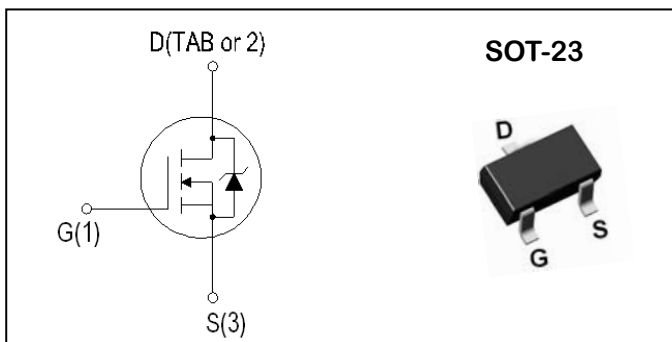


## N-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

$V_{DSS}$	$I_D$	$R_{DS(ON)} (m\Omega)$
30V	5.8A	19m $\Omega$



### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise specified )

Symbol	Parameter	Ratings	Unit	
Common Ratings				
V <sub>DSS</sub>	Drain-Source Voltage	30	V	
V <sub>GSS</sub>	Gate-Source Voltage	± 12		
T <sub>J</sub>	Maximum Junction Temperature	150	°C	
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C	
Mounted on Large Heat Sink				
I <sub>DM</sub>	300μs Pulse Drain Current Tested <sup>(1)</sup>	T <sub>C</sub> =25°C	23	A
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C	5.8	A
		T <sub>C</sub> =100°C	4	A
P <sub>D</sub>	Maximum Power Dissipation <sup>(3)</sup>	1.3	W	

### Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{thJA}$	Thermal resistance junction-ambient max <sup>(3)</sup>	95	$^\circ\text{C/W}$

## Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250uA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V	--	--	1	uA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	0.6	0.95	1.3	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 12V, V <sub>DS</sub> =0V	--	--	± 100	nA
R <sub>DS(ON)</sub>	Drain-SourceOn-stateResistance <sup>(2)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> =4.2A	--	19	26	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =4.0A	--	23	32	
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =1.0A	--	27	42	
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V,	--	785	--	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = 15V,	--	65	--	
C <sub>rss</sub>	Reverse Transfer Capacitance	Frequency=1.0MHz	--	54	--	
Switching Characteristics						
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V,	--	4.0	--	ns
t <sub>r</sub>	Turn-on Rise Time	I <sub>D</sub> =3.0A, V <sub>GS</sub> = 10V,	--	11	--	
t <sub>d(OFF)</sub>	Turn-off Delay Time	R <sub>GEN</sub> =3 Ω	--	24	--	
t <sub>f</sub>	Turn-off Fall Time		--	2.0	--	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V,	--	19	--	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>GS</sub> =0 to 10V,	--	2.0	--	
Q <sub>gd</sub>	Gate-Drain Charge	I <sub>D</sub> =3.0A	--	2.1	--	
Diode Characteristics						
I <sub>s</sub>	Maximum Continuous Drain to Source Diode Forward Current		--	--	5.8	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		--	--	23	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	I <sub>s</sub> =5.8A, V <sub>GS</sub> =0V	--	--	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =3A	--	8.4	--	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	di/dt=100A/us	--	3.3	--	nC

### NOTES:

- 1.Pulse Width Limited by Maximum Junction Temperature
- 2.Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
- 3.Surface Mounted on FR4 Board, t < 10 sec.

## Test circuits and Waveforms

Figure 1: Resistive Switching Test Circuit & Waveform

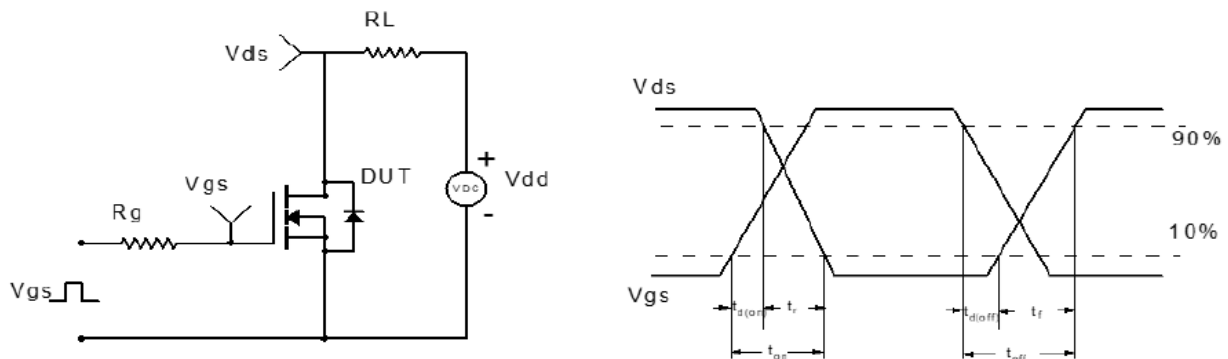


Figure 2: Diode Recovery Test Circuit & Waveform

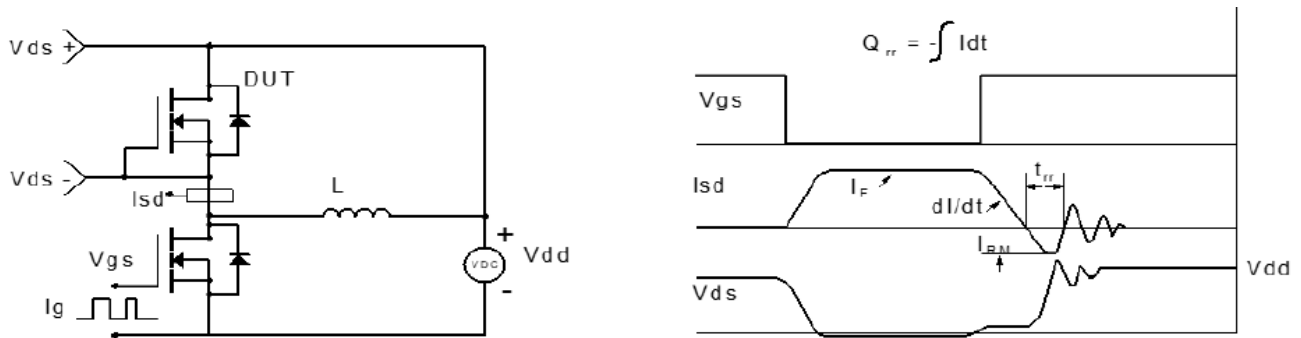


Figure 3: Gate Charge Test Circuit & Waveform

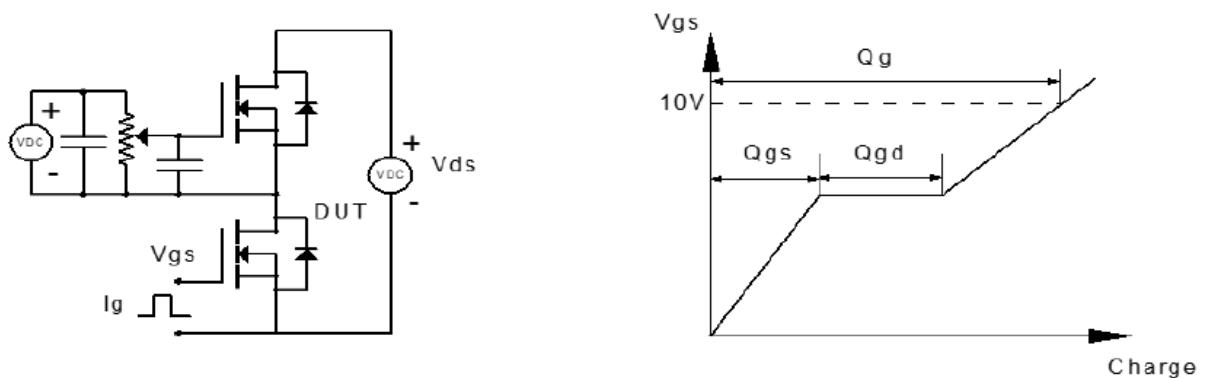
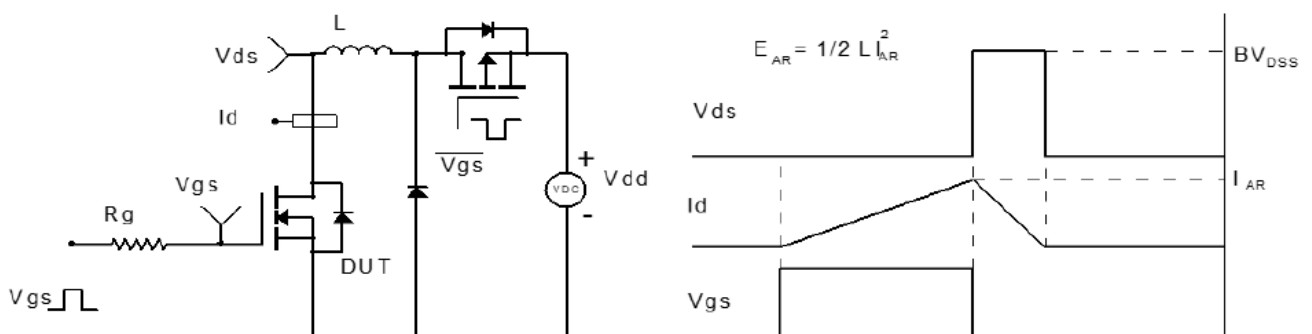


Figure 4: Unclamped Inductive Switching Test Circuit & Waveform



## Typical Performance Characteristics

Figure 1: Typical Output Characteristics

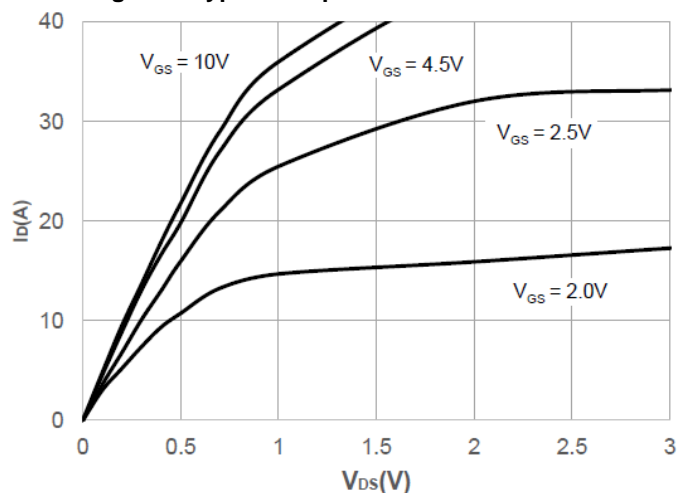


Figure 2: Typical Transfer Characteristics

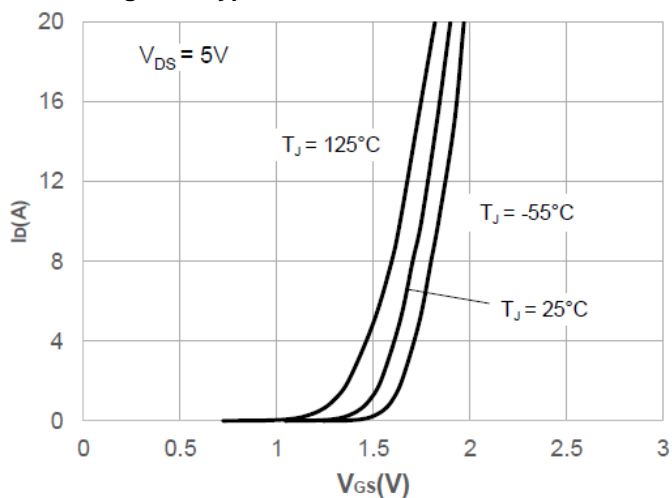


Figure 3: Typical Drain-to-Source On Resistance

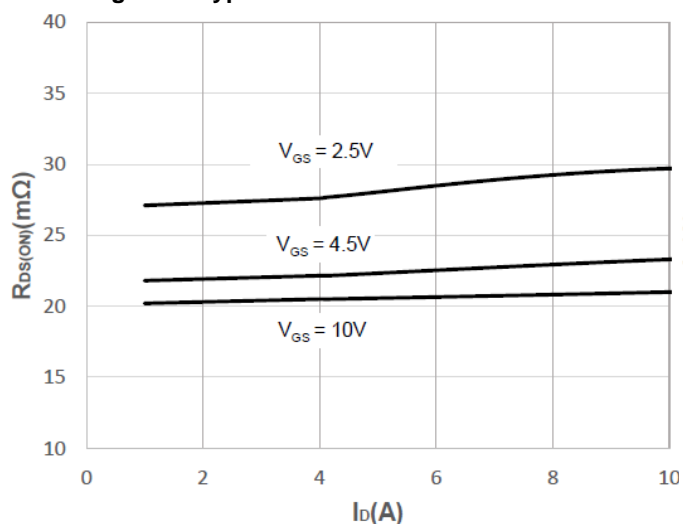


Figure 4: Typical Body Diode Characteristics

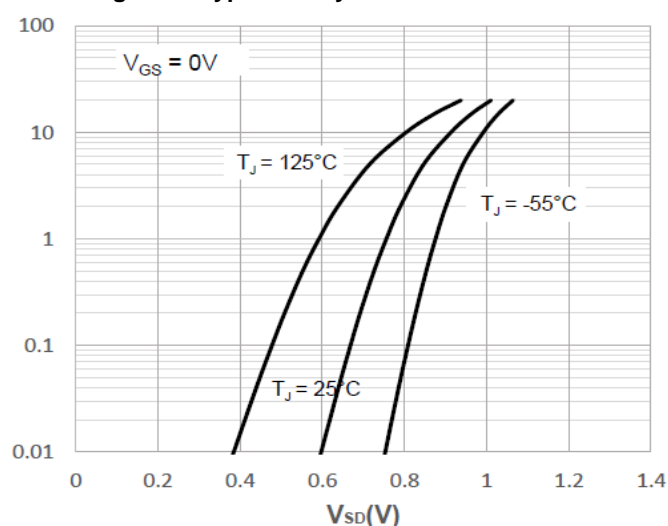


Figure 5: Typical Capacitance vs. Drain-to-Source Voltage

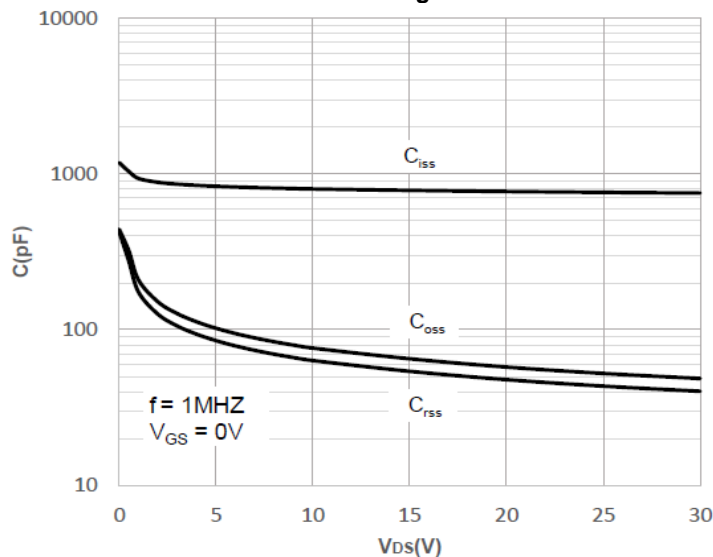
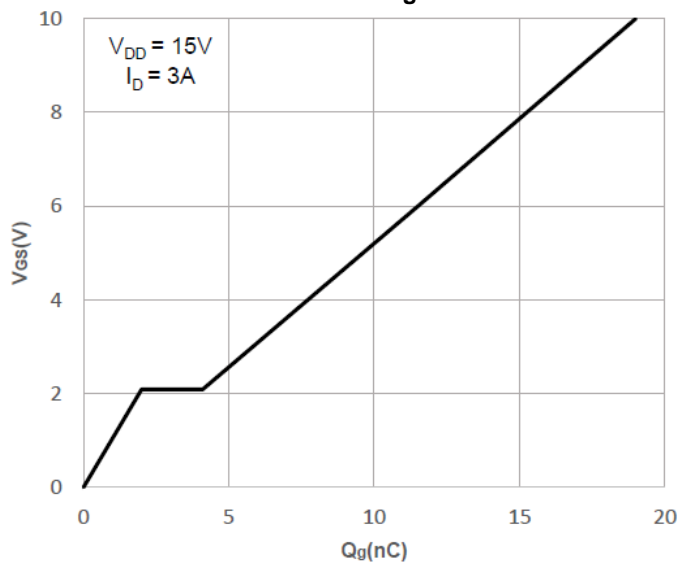
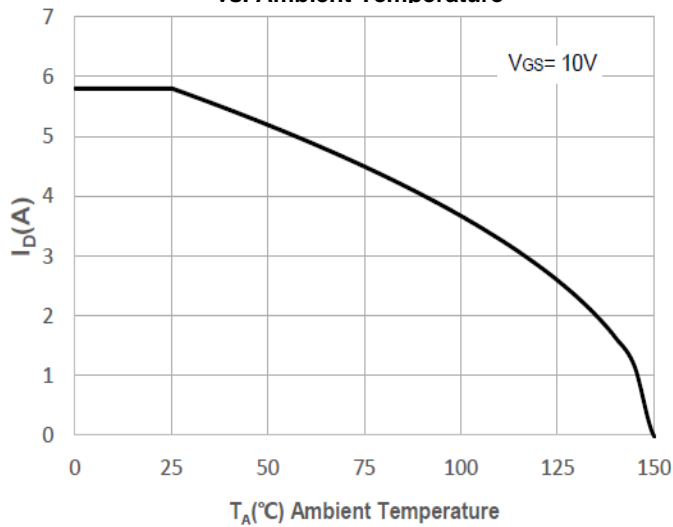


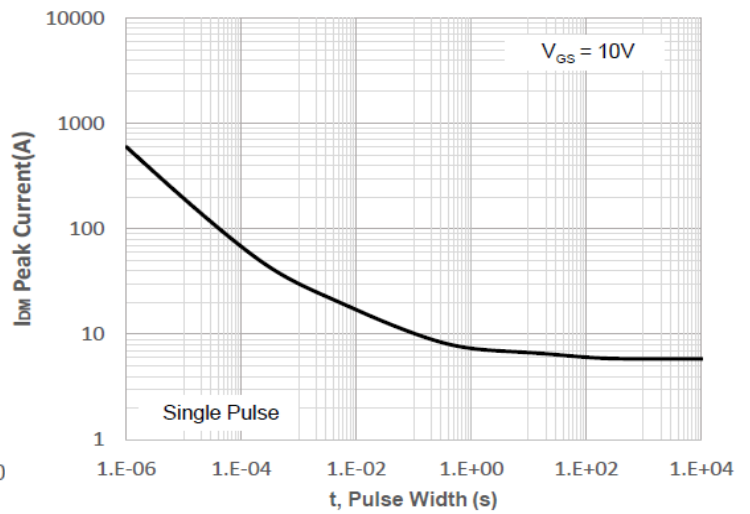
Figure 6: Typical Gate Charge vs. Gate-to-Source Voltage



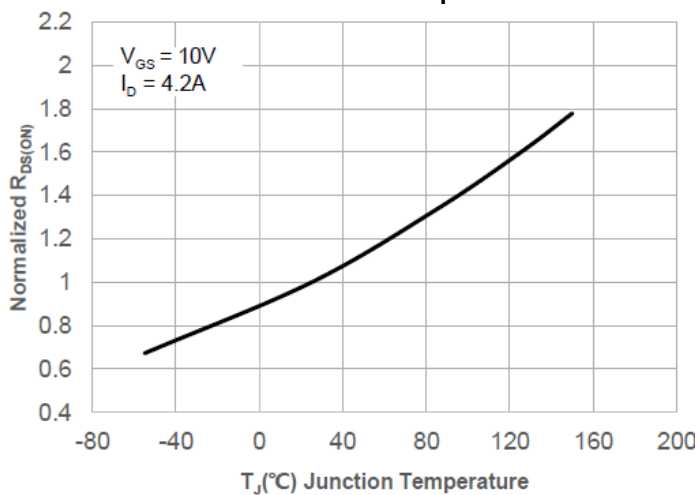
**Figure 7: Maximum Continuous Drain Current vs. Ambient Temperature**



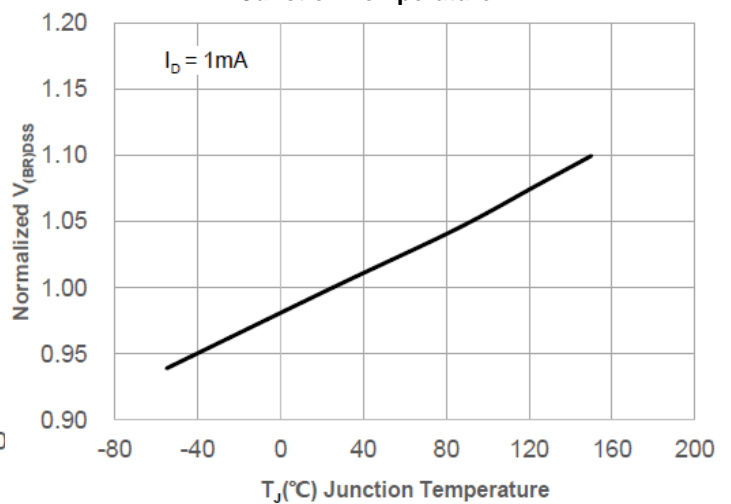
**Figure 8: Peak Current Capacity**



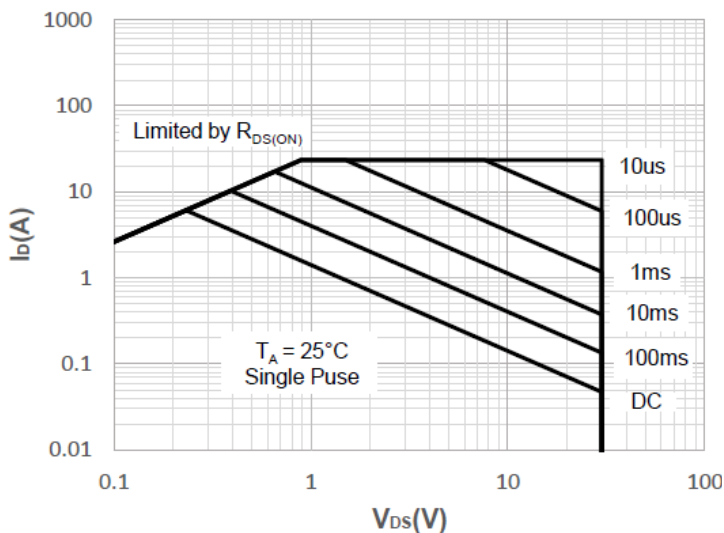
**Figure 9: Typical Drain-to-Source On Resistance vs. Junction Temperature**



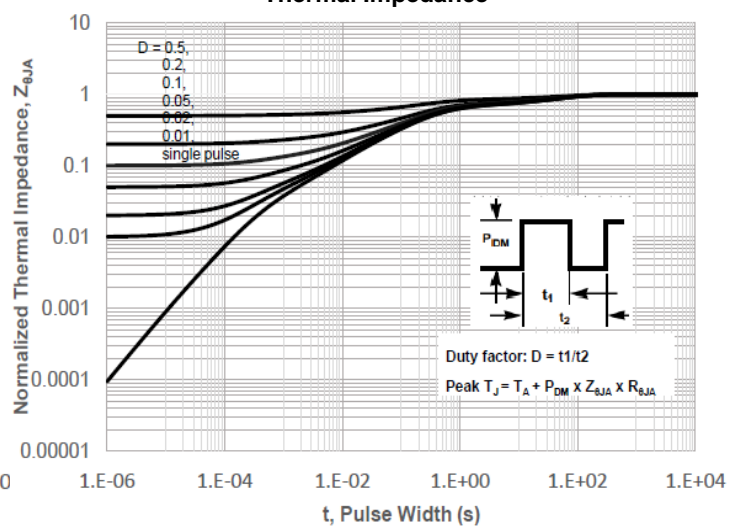
**Figure 10: Typical Breakdown Voltage vs. Junction Temperature**



**Figure 11: Maximum Forward Safe Operation Area**

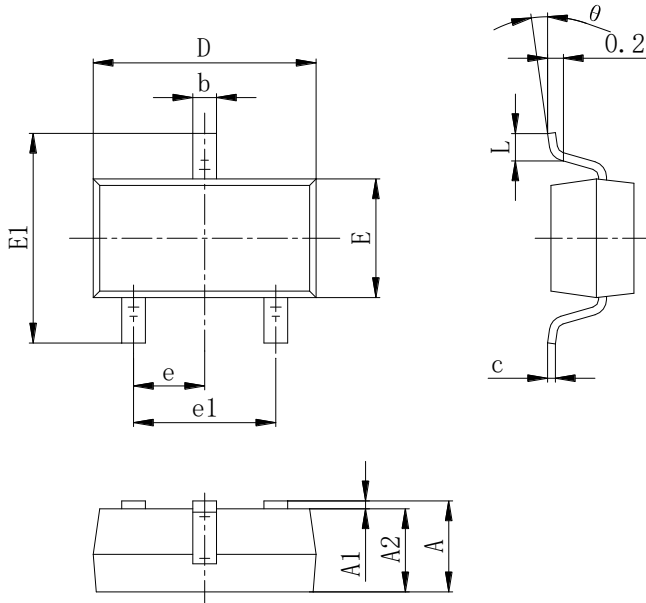


**Figure 12: Normalized Maximum Transient Thermal Impedance**



## PACKAGE MECHANICAL DATA

### SOT-23 Package Dimension



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	1.100	0.035	0.043
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.	
θ	0°	8°	0°	8°

### Ordering information

Part number	Package	Marking	Packing	Quantity
ADM3400	SOT-23	3400	Tape&reel	3000pcs

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