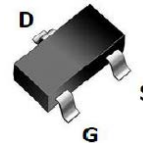


20V N-Channel Power MOSFET

DESCRIPTION :

- Excellent $R_{DS(ON)}$
- Low Gate Charge
- Advanced Trench Technology
- Pb-Free Lead Plating
- RoHS compliant

V_{DSS}	20V
$I_D (T_A=25^\circ\text{C})$	0.75A
$R_{DS(ON_Typ.)@V_{GS}=4.5V}$	145m Ω



SOT-523

TYPICAL APPLICATIONS :

- Power Management
- Load Switch
- PWM Application

MAXIMUM RATINGS (at $T_c = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 10	V
Continuous Drain Current	$T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	I_D	0.75 0.5	A
Pulsed Drain Current		I_{DM}	3	A
Power dissipation	$T_A=25^\circ\text{C}$	P_D	0.17	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient	$R_{\theta JA}$	735	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage $V_{GS} = 0V, I_D = 250\mu A$	$V_{(BR)DSS}$	20			V
Zero Gate Voltage Drain Current $V_{DS} = 20V, V_{GS} = 0V$	I_{DSS}			1	μA
Gate-Source Leakage Current $V_{GS} = \pm 10V, V_{DS} = 0V$	I_{GSS}			± 10	μA
Gate-Source threshold voltage $V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	0.4	0.7	1.0	V
Drain-Source On-State Resistance $V_{GS} = 4.5V, I_D = 0.5A$ $V_{GS} = 2.5V, I_D = 0.4A$	$R_{DS(on)}$		145 225	240 315	m Ω
Input capacitance $f=1MHz, V_{DS}=10V, V_{GS}=0V$	C_{iss}		60		pF
Output capacitance $f=1MHz, V_{DS}=10V, V_{GS}=0V$	C_{oss}		22		pF
Reverse transfer capacitance $f=1MHz, V_{DS}=10V, V_{GS}=0V$	C_{rss}		12		pF
Total Gate Charge $V_{DS}= 10V, I_D= 0.75A, V_{GS}= 4.5V$	Q_G		1		nC
Gate to Source Charge $V_{DS}= 10V, I_D= 0.75A, V_{GS}= 4.5V$	Q_{GS}		0.28		nC
Gate to Drain Charge $V_{DS}= 10V, I_D= 0.75A, V_{GS}= 4.5V$	Q_{GD}		0.22		nC
Turn-on delay time $V_{DS}=10V, V_{GS}= 4.5V, I_D= 0.5A, R_{GEN}=10\Omega$	$t_{d(ON)}$		2		ns
Rise time $V_{DS}=10V, V_{GS}= 4.5V, I_D= 0.5A, R_{GEN}=10\Omega$	t_r		19		ns
Turn-off delay time $V_{DS}=10V, V_{GS}= 4.5V, I_D= 0.5A, R_{GEN}=10\Omega$	$t_{d(OFF)}$		10		ns
Fall time $V_{DS}=10V, V_{GS}= 4.5V, I_D= 0.5A, R_{GEN}=10\Omega$	t_f		23		ns

Body Diode

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage $V_{GS} = 0V, I_S = 0.75A$	V_{SD}			1.2	V
Maximum Continuous Body Diode Forward Current	I_S			0.75	A
Maximum Pulsed Body Diode Forward Current	I_{SM}			3.0	A

Typical Performance Characteristics

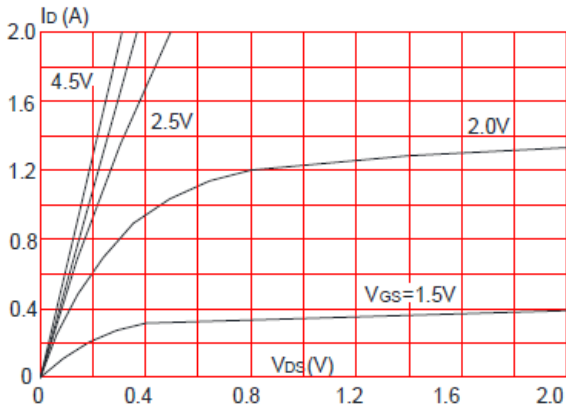


Figure 1. Output Characteristics

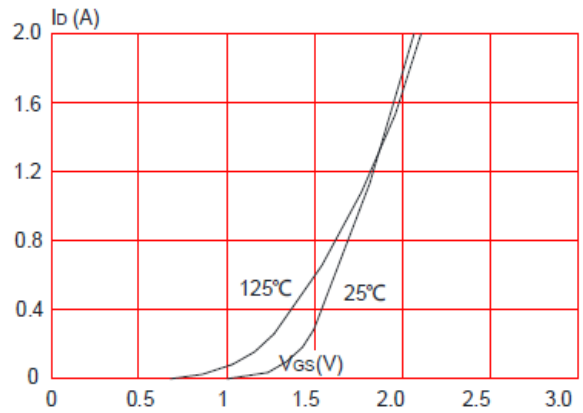


Figure 2. Typical Transfer Characteristics

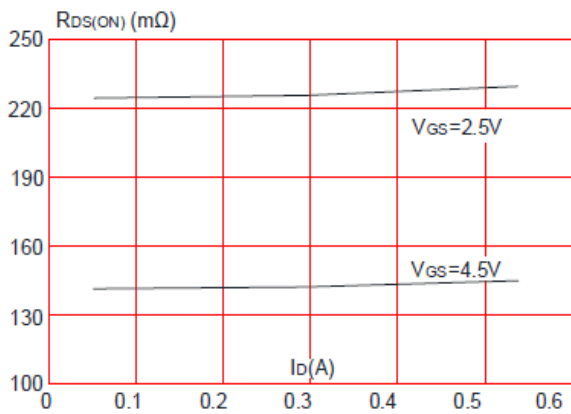


Figure 3. On-resistance vs. Drain Current

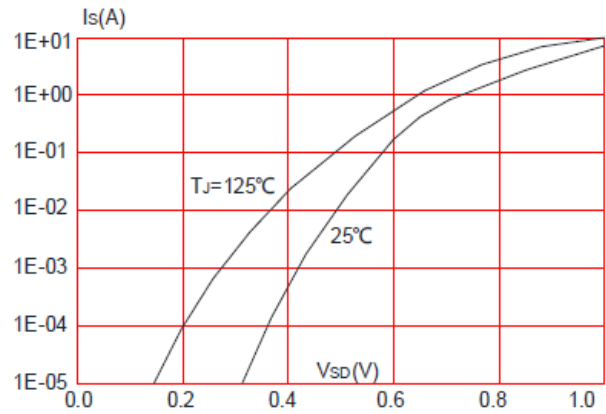


Figure 4. Body Diode Characteristics

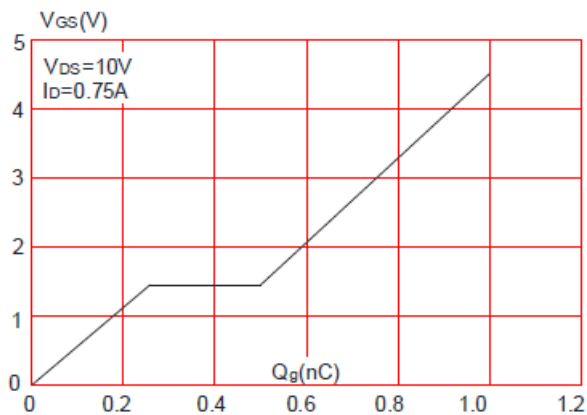


Figure 5. Gate Charge Characteristics

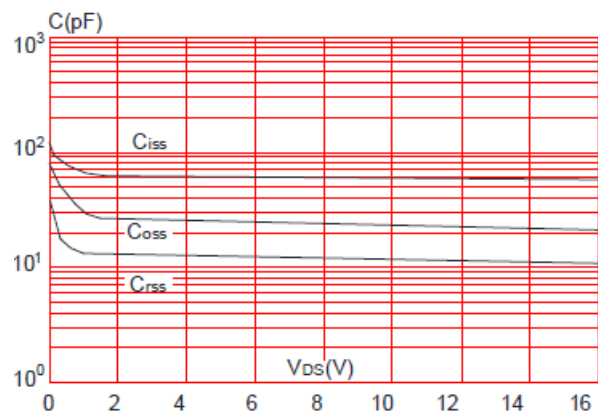


Figure 6. Capacitance Characteristics

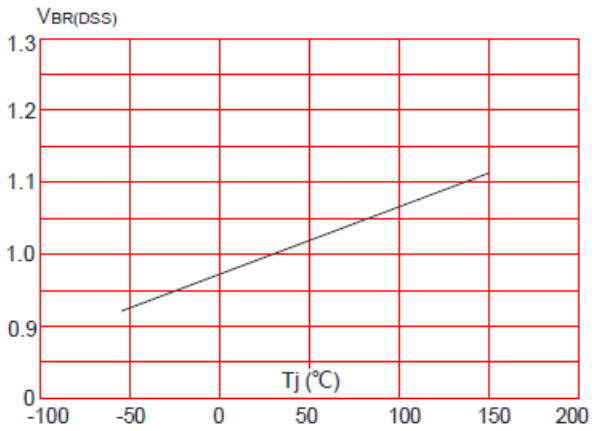


Figure 7. Normalized Breakdown voltage vs. Junction Temperature

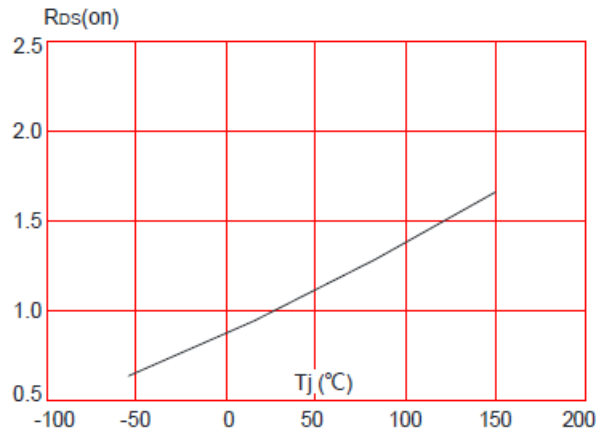


Figure 8. Normalized on Resistance vs. Junction Temperature

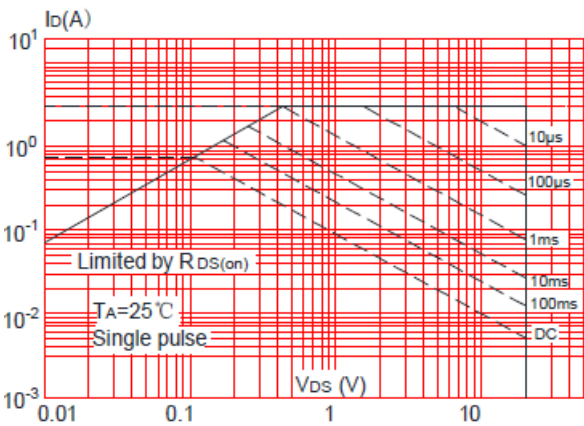


Figure 9. Maximum Safe Operating Area

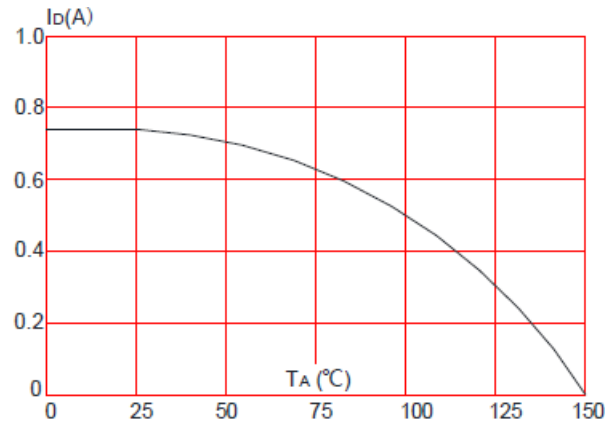


Figure 10. Maximum Continuous Drian Current vs. Case Temperature

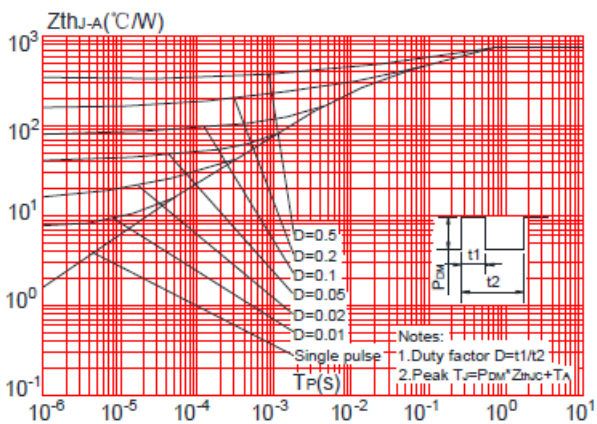
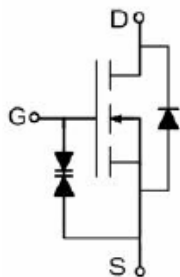
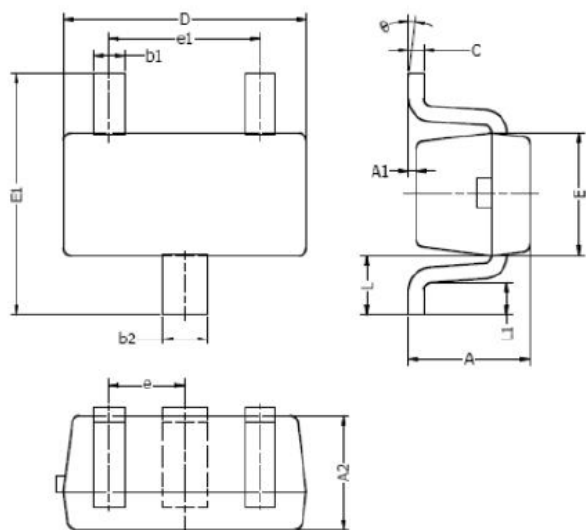


Figure 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

• Circuit diagram



• Package outlines :



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.60	1.70	0.063	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
theta	0°	8°	0°	8°

NOTES:
 1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
 2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

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