

20V P-Channel Enhancement Mode Field Effect Transistor

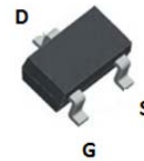
DESCRIPTION :

- High dense cell design for extremely low $R_{DS(ON)}$
- Rugged and reliable
- $R_{DS(ON),typ.} = 52m\Omega @ V_{GS} = -4.5V$
- RoHS compliant

V_{DS}	-20V
I_{D_MAX}	-3.9A
$R_{DS(ON)_MAX} @ V_{GS} = -4.5V$	52m Ω

TYPICAL APPLICATIONS :

- Synchronous Rectification
- Power Management
- Load Switch



SOT-23

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current		I_D	-3.9	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	-15.6	A
Power dissipation		P_D	1.25	W
Operating & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Notes : 1. Repetitive rating; pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction-to-Ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = -250uA	BV _{DSS}	-20			V
Zero Gate Voltage Drain Current VDS = -20 V, VGS = 0 V	I _{DSS}			-1	uA
Gate-Source Leakage Current VGS = ±12V, VDS = 0V	I _{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	V _{GS(th)}	-0.4		-1.0	V
Drain-Source On-State Resistance VGS = -4.5V, ID = -0.5A VGS = -2.5V, ID = -0.5A	R _{DS(on)}		42 56	52 72	mΩ
Input capacitance f=1MHz, VDS= -10 V, VGS=0 V	C _{iss}		675		pF
Output capacitance f=1MHz, VDS= -10 V, VGS=0 V	C _{oss}		105		pF
Reverse transfer capacitance f=1MHz, VDS= -10 V, VGS=0 V	C _{rss}		85		pF
Total Gate Charge VDD= -10V, ID= -3.8A, VGS= -4.5V	Q _G		8.7		nC
Gate to Source Charge VDD= -10V, ID= -3.8A, VGS= -4.5V	Q _{GS}		0.7		nC
Gate to Drain Charge VDD= -10V, ID= -3.8A, VGS= -4.5V	Q _{GD}		2.6		nC
Turn-on delay time VDD= -10 V, VGS= -4.5V, ID= -3.8A, R _{GEN} = 3Ω	td _(ON)		11		ns
Turn-on Rise time VDD= -10 V, VGS= -4.5V, ID= -3.8A, R _{GEN} = 3Ω	tr		5		ns
Turn-off delay time VDD= -10 V, VGS= -4.5V, ID= -3.8A, R _{GEN} = 3Ω	td _(OFF)		35		ns
Turn-off Fall time VDD= -10 V, VGS= -4.5V, ID= -3.8A, R _{GEN} = 3Ω	tf		7		ns

Body Diode

Drain to Source Diode Forward Current	I _S			-1.0	A
Drain to Source Diode Forward Voltage VGS = 0V, I _S = -0.5A	V _{SD}			-1.2	V

Typical Characteristics

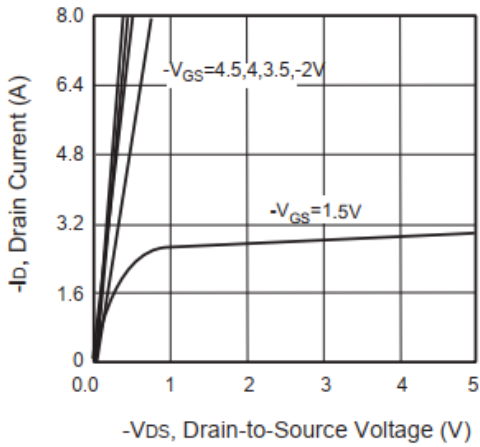


Figure 1. Output Characteristics

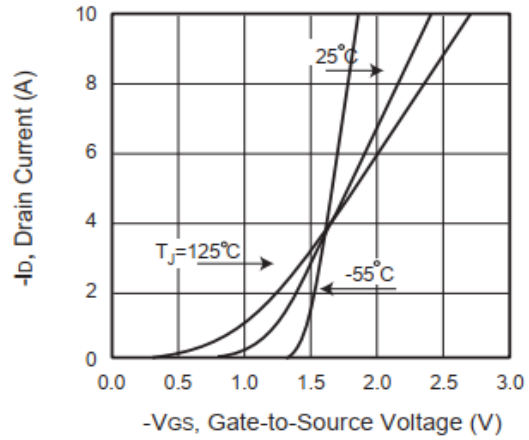


Figure 2. Transfer Characteristics

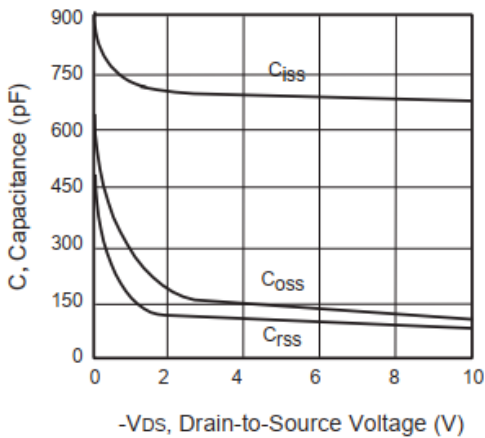


Figure 3. Capacitance

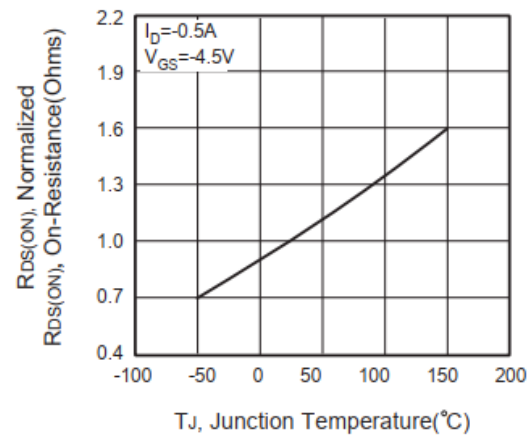


Figure 4. On-Resistance Variation with Temperature

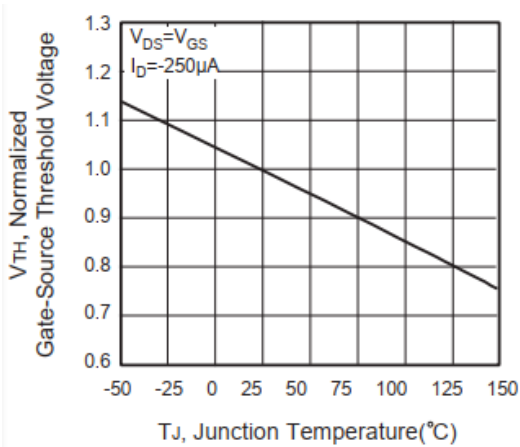


Figure 5. Gate Threshold Variation with Temperature

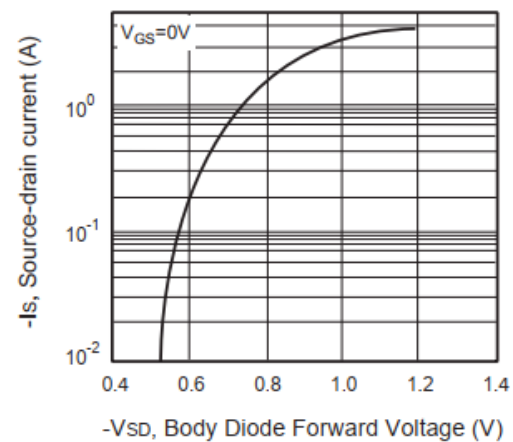


Figure 6. . Body Diode Forward Voltage Variation with Source Current

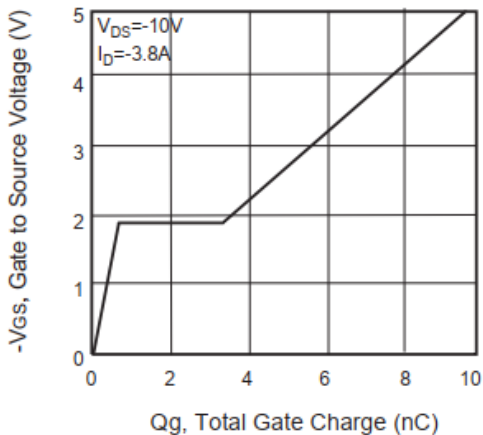


Figure 7. Gate Charge Characteristics

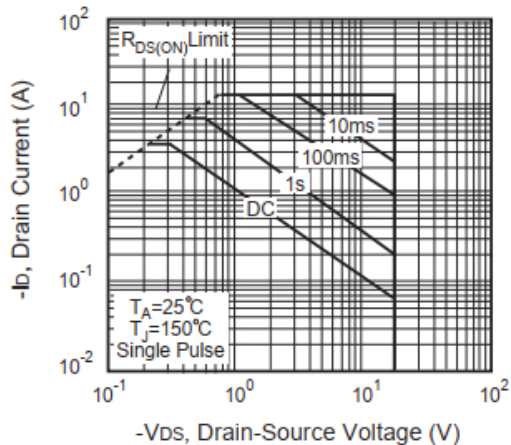


Figure 8. Maximum Safe Operating Area

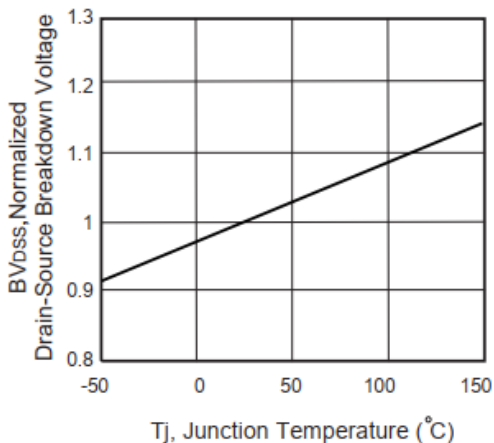


Figure 9. Breakdown Voltage Variation vs. Temperature

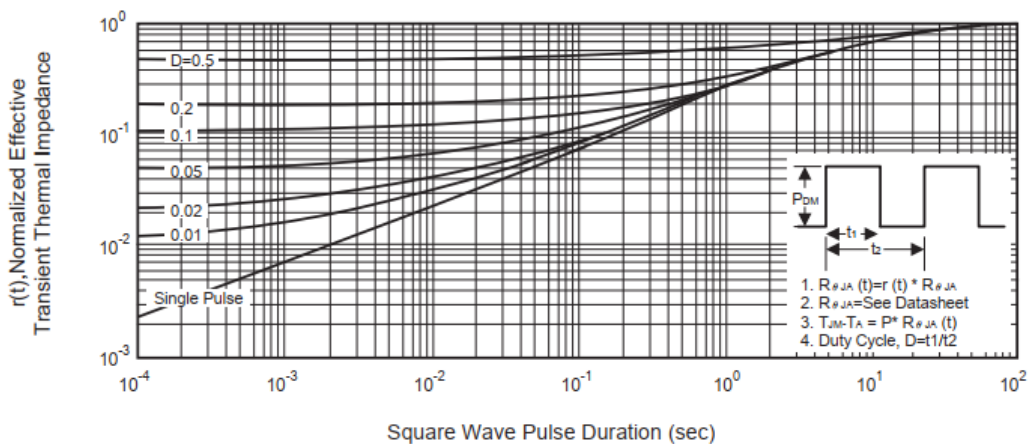
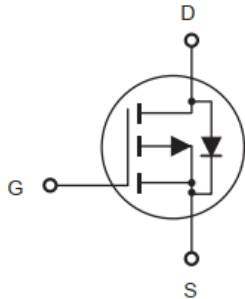
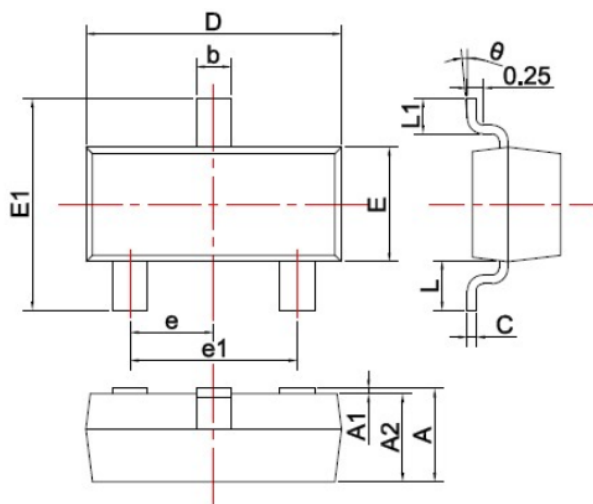


Figure 10. Normalized Thermal Transient Impedance Curve

- Circuit diagram



- SOT-23 Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 Typ.	
e1	1.80	2.00
L	0.55 Ref.	
L1	0.30	0.50
θ	0°	8°

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