

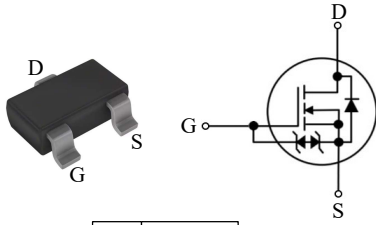


# SM03150KWITH

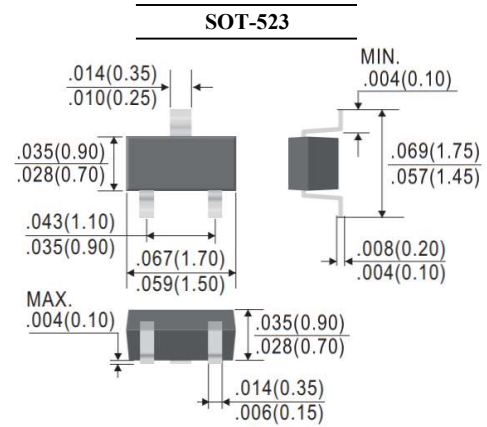
## N-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- Low Gate Threshold Voltage
- ESD Protected  $\geq 1\text{kV}$
- Suffix "H" indicates Halogen-free parts, ex.SM03150KWITH



D	Drain
G	Gate
S	Source



Dimensions in inch and (millimeter)

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current	$I_D$	1	A
Pulsed Drain Current (Note 1)	$I_{DM}$	4	A
Power Dissipation (Note 2)	$P_D$	0.15	W
Thermal Resistance Junction to Ambient (Note 2)	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	- 55 to + 150	$^\circ\text{C}$

Note :

1. Pulse width  $\leq 100\mu\text{s}$ , Duty cycle  $\leq 2\%$ , Repetitive rating, pulse width limited by junction temperature  $T_{J(\text{MAX})} = 150^\circ\text{C}$
2. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout



# SM03150KWTB

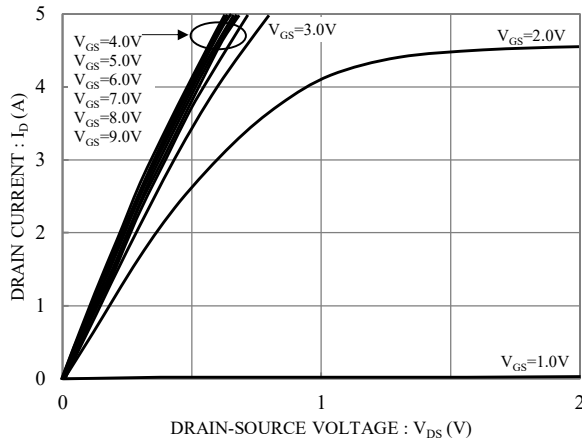
## N-Channel Enhancement Mode Field Effect Transistor

### Electrical Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)

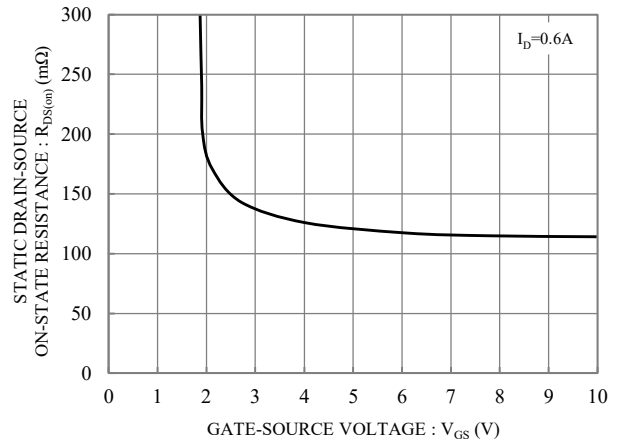
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain Source Breakdown Voltage	$I_D = 250\mu\text{A}$	$V_{DSS}$	30	-	-	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.5	-	1.0	V
Zero Gate Voltage Drain Current	$V_{DS} = 24\text{V}$	$I_{DSS}$	-	-	1	$\mu\text{A}$
Gate-Body Leakage Current	$V_{GS} = \pm 10\text{V}$	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$
Drain-Source On-State Resistance	$V_{GS} = 4.5\text{V}, I_D = 0.6\text{A}$	$R_{DS(on)}$	-	-	0.15	$\Omega$
	$V_{GS} = 2.5\text{V}, I_D = 0.5\text{A}$		-	-	0.20	
	$V_{GS} = 1.8\text{V}, I_D = 0.5\text{A}$		-	-	0.32	
Forward Transfer Admittance	$V_{DS} = 5\text{V}, I_D = 1\text{A}$	$g_{FS}$	-	4	-	S
<b>Dynamic</b>						
Gate Resistance	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$	$R_g$	-	1458	-	$\Omega$
Total Gate Charge	$V_{DS} = 15\text{V}, I_D = 1\text{A}, V_{GS} = 4.5\text{V}$	$Q_g$	-	2.6	-	nC
Gate Source Charge		$Q_{gs}$	-	0.4	-	
Gate Drain Charge		$Q_{gd}$	-	0.5	-	
Input Capacitance	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	$C_{iss}$	-	160	-	pF
Output Capacitance		$C_{oss}$	-	16	-	
Reverse Transfer Capacitance		$C_{rss}$	-	9	-	
Turn-On Delay Time	$V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}, I_D = 1\text{A}, R_g = 4.7\Omega$	$t_{d(on)}$	-	407	-	ns
Turn-On Rise Time		$t_r$	-	116	-	
Turn-Off Delay Time		$t_{d(off)}$	-	307	-	
Turn-Off Fall Time		$t_f$	-	71	-	
<b>Drain-Source Body Diode</b>						
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = 1\text{A}$	$V_{SD}$	-	-	1.0	V



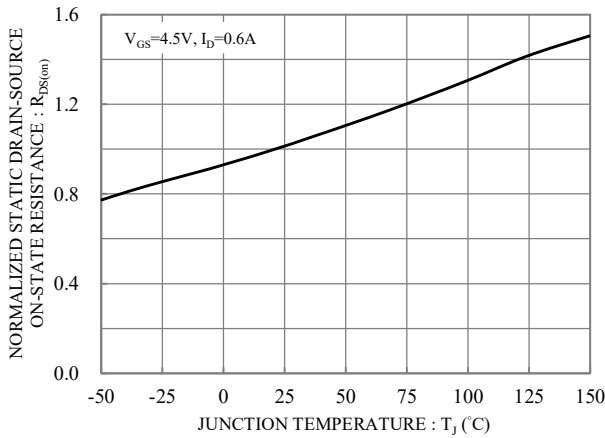
### RATINGS AND CHARACTERISTIC CURVES



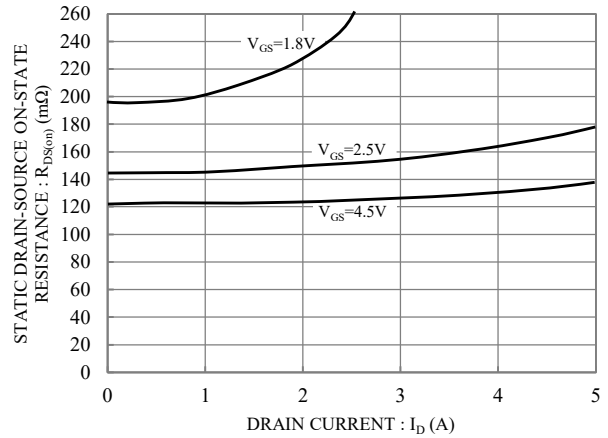
**Fig.1 Typical Output Characteristics**



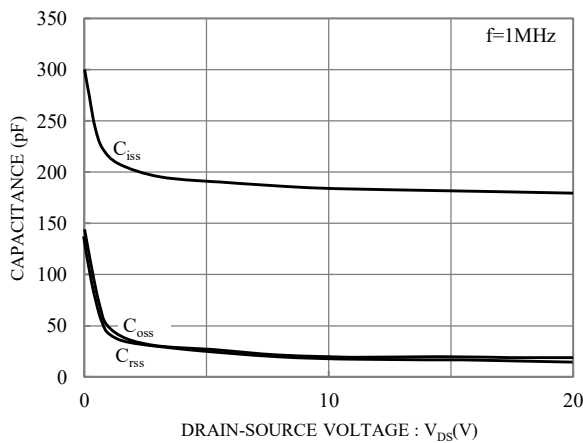
**Fig.2 Static Drain-Source On-State Resistance vs. Gate-Source Voltage**



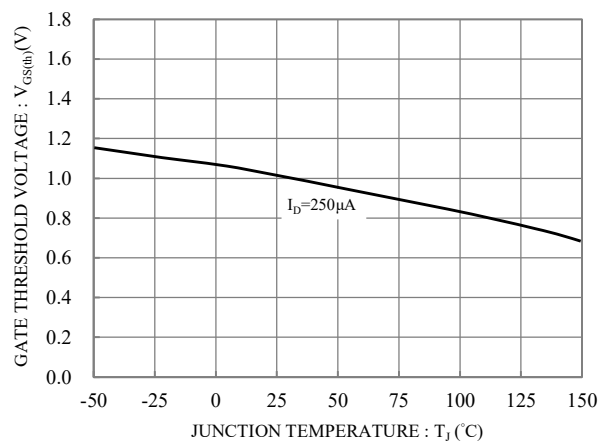
**Fig.3 Drain-Source On-State Resistance vs Junction Temperature**



**Fig.4 Static Drain-Source On-State Resistance vs. Drain Current**



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

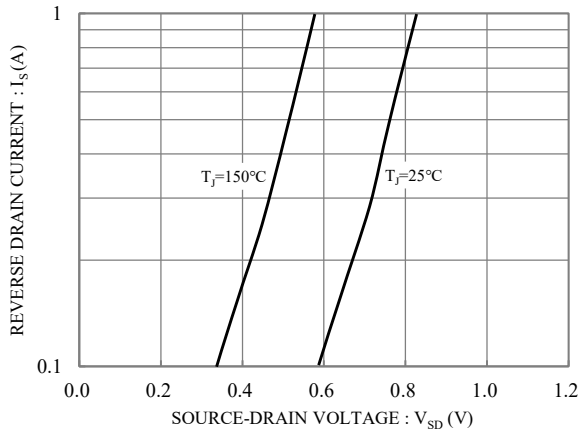


**Fig.6 Threshold Voltage vs Junction Temperature**

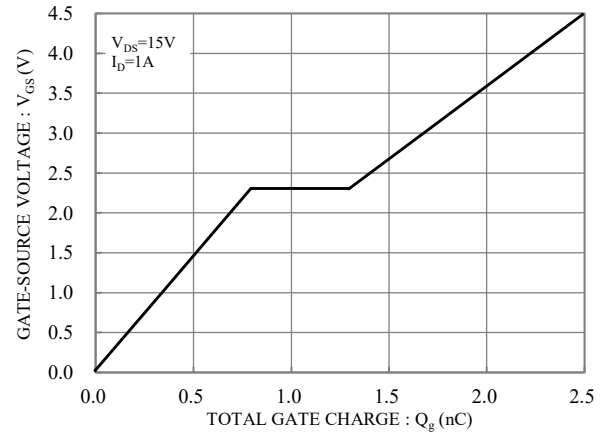


# SM03150KWT

## N-Channel Enhancement Mode Field Effect Transistor



**Fig.7 Typical Forward Characteristic**



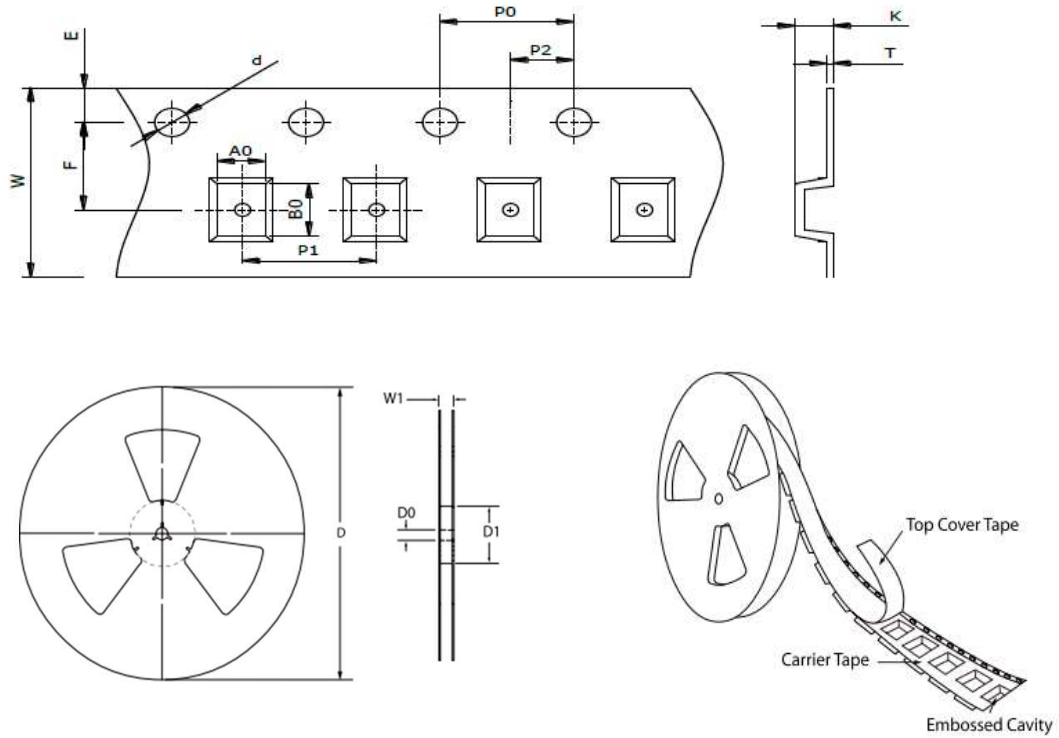
**Fig.8 Gate Charge Characteristics**



# SM03150KWTH

## N-Channel Enhancement Mode Field Effect Transistor

### TAPE & REEL SPECIFICATION



Item	Symbol	SOT-523
Carrier width	A <sub>0</sub>	1.95 ± 0.10
Carrier length	B <sub>0</sub>	1.90 ± 0.10
Carrier depth	K	1.20 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D <sub>0</sub>	13.00 ± 0.50
Reel inner diameter	D <sub>1</sub>	MIN. 50.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P <sub>0</sub>	4.00 ± 0.10
Punch hole pitch	P <sub>1</sub>	4.00 ± 0.10
Embossment center	P <sub>2</sub>	2.00 ± 0.10
Overall tape thickness	T	0.20 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W1	MAX. 14.50

### ORDER INFORMATION

Package	Reel Size	Quantity
SOT-523	7"	4,000

### MARKING CODE

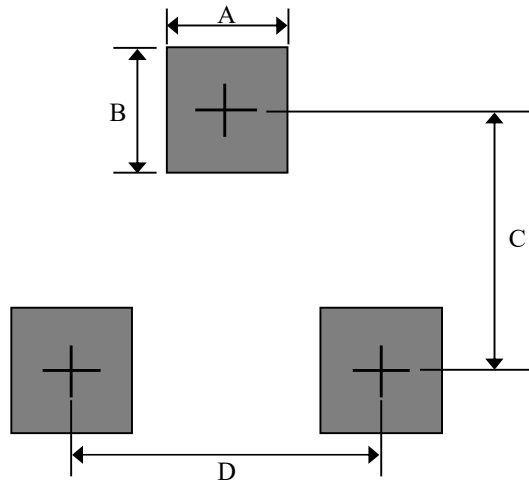
Part Number	Marking Code
SM03150KWTH	MV



# SM03150KWITH

*N-Channel Enhancement Mode Field Effect Transistor*

## **SUGGESTED SOLDER PAD LAYOUT**



Unit : mm

PACKAGE	A	B	C	D
SOT-523	0.70	0.70	1.30	1.00