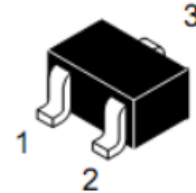


SPM0353EA

Single P-Channel, -30V, -4.6A, Power MOSFET

<http://www.sitcores.com/>

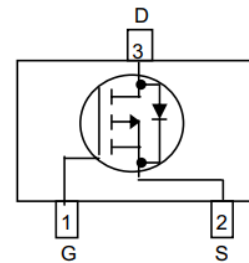
V _{DS} (V)	Max. R _{DS(on)} (mΩ)
-30	53@ V _{GS} =-10V
	93@ V _{GS} =-4.5V



SOT-23

Descriptions

The SPM0353EA is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R_{DS(ON)} with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product SPM0353EA is Pb-free.



Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Small package SOT-23

Pin configuration (Top view)



W32 = Device Code

* = Month(A~Z)

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Marking

Order information

Device	Package	Shipping
SPM0353EA-3/T R	SOT-23	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V _{DS}	-30		V
Gate-Source Voltage		V _{GS}	±20		
Continuous Drain Current	T _A =25°C	I _D	-4.6	-3.8	A
	T _A =70°C		-3.7	-3.0	
Maximum Power Dissipation ^b	T _A =25°C	P _D	1.7	1.1	W
	T _A =70°C		1.1	0.7	
Pulsed Drain Current ^c		I _{DM}	-16		A
Operating Junction Temperature		T _J	-55 to 150		°C
Lead Temperature		T _L	260		°C
Storage Temperature Range		T _{stg}	-55 to 150		°C

Thermal resistance ratings

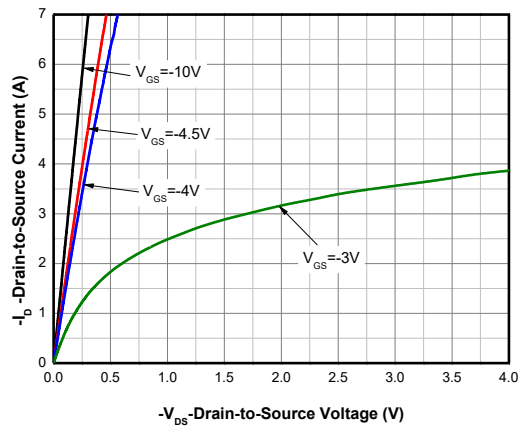
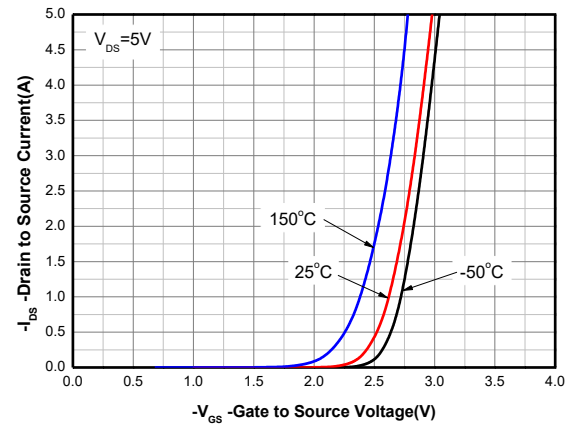
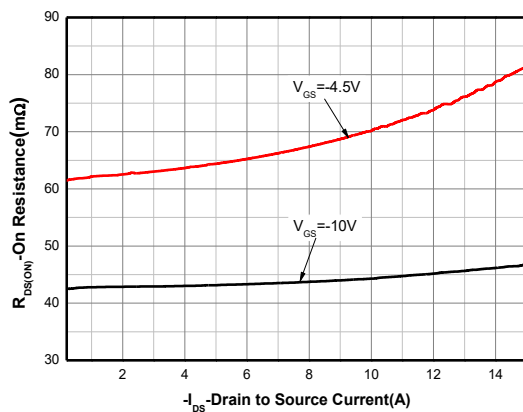
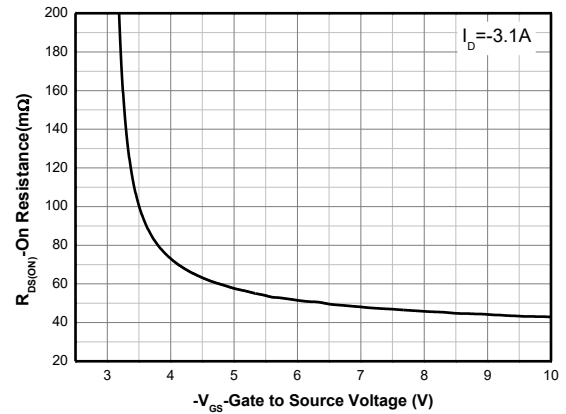
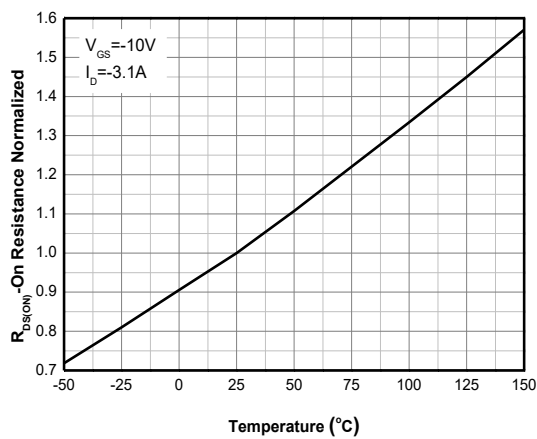
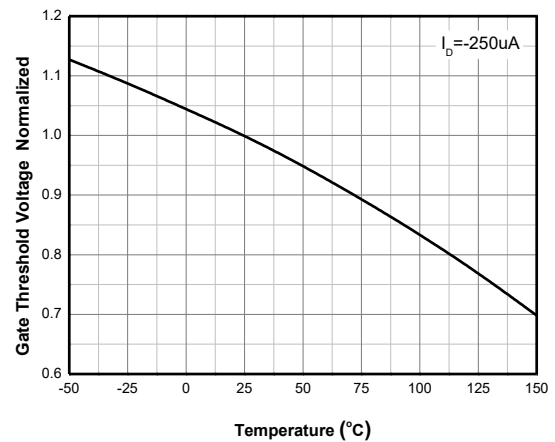
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	62	74	$^{\circ}\text{C/W}$
	Steady State		91	109	
Junction-to-Lead Thermal Resistance	Steady State	$R_{\theta JL}$	39	47	

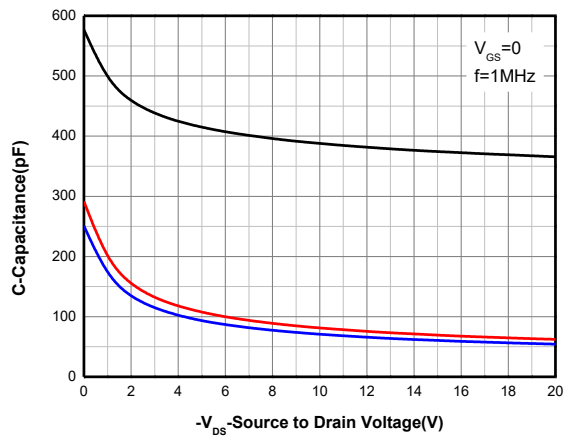
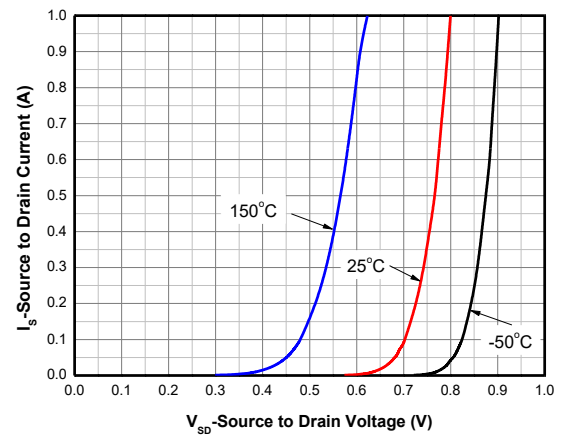
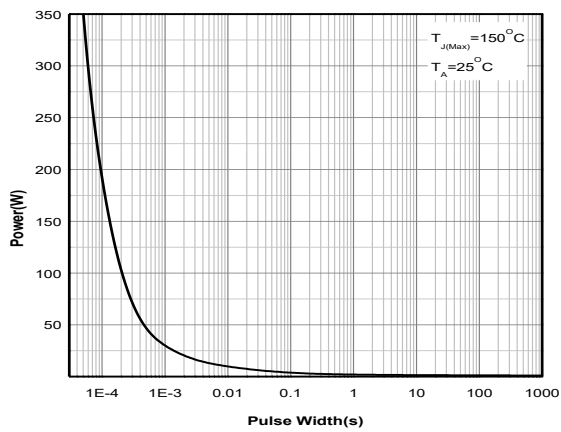
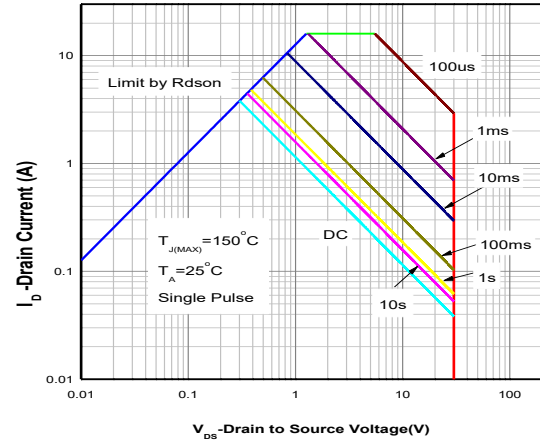
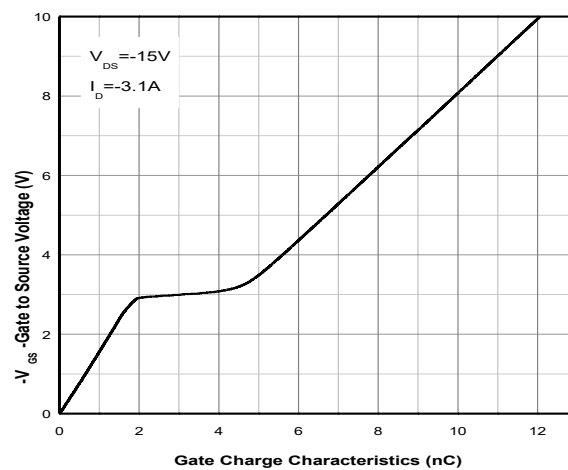
Note:

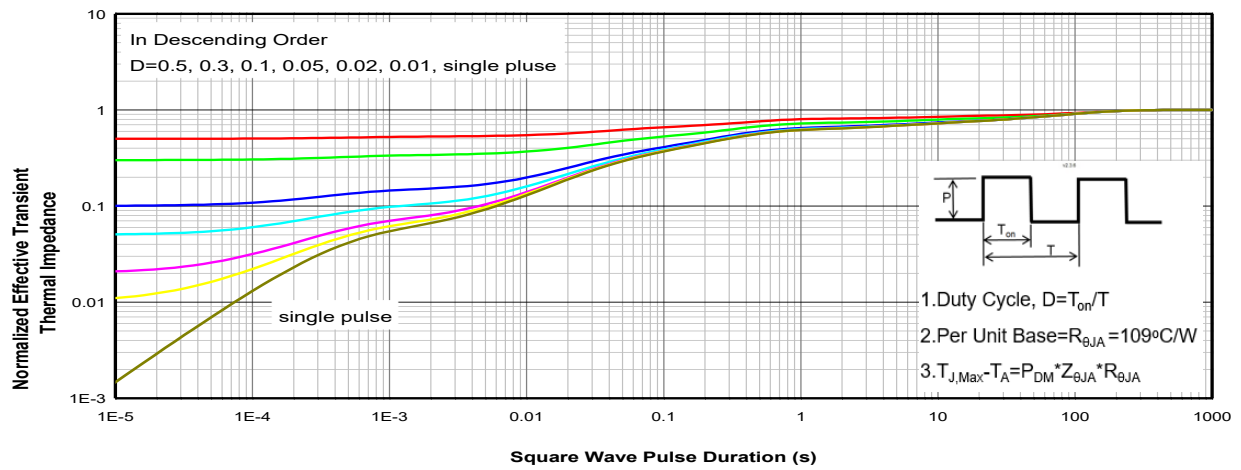
- FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm² area)
- The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{ s}$ value and the $T_J(\text{MAX})=150^{\circ}\text{C}$.
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J=25^{\circ}\text{C}$, the maximum allowed junction temperature of 150°C .
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

Electronics Characteristics (Ta=25°C, unless otherwise noted)

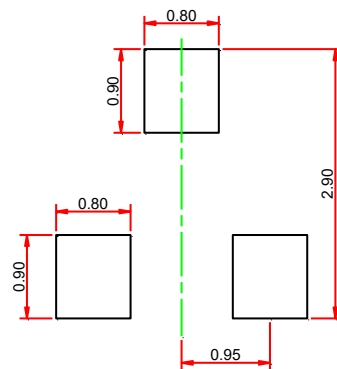
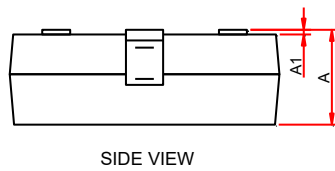
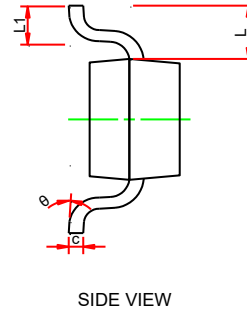
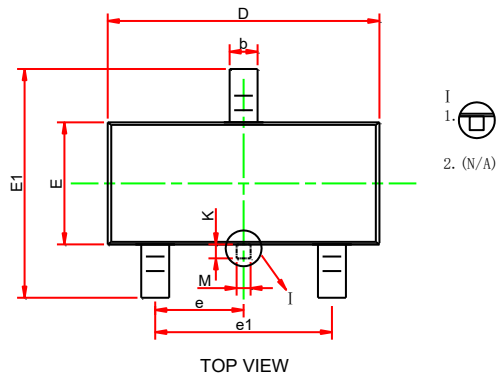
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = -250uA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24 V, V _{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20V			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-1.4	-1.9	-2.5	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -4A		42	53	mΩ
		V _{GS} = -4.5V, I _D = -3A		64	93	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = -20 V		366		pF
Output Capacitance	C _{OSS}			62		
Reverse Transfer Capacitance	C _{RSS}			54		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = -10 V, V _{DS} = -15 V, I _D = -3.1A		12		nC
Threshold Gate Charge	Q _{G(TH)}			1.24		
Gate-to-Source Charge	Q _{GS}			1.96		
Gate-to-Drain Charge	Q _{GD}			2.37		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = -10 V, V _{DS} = -15 V, R _L =5 Ω, R _G =15 Ω		5.6		ns
Rise Time	tr			12.7		
Turn-Off Delay Time	td(OFF)			31.9		
Fall Time	tf			18.7		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = -1.0A		-0.8	-1.2	V

Typical Characteristics (Ta=25°C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

On-Resistance vs. Gate-to-Source Voltage

On-Resistance vs. Junction Temperature

Threshold Voltage vs. Temperature


Capacitance

Body Diode Forward Voltage

Single pulse power

Safe operating power

Gate Charge Characteristics

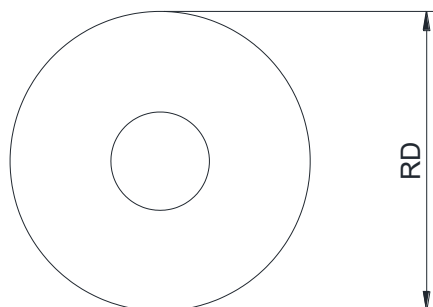
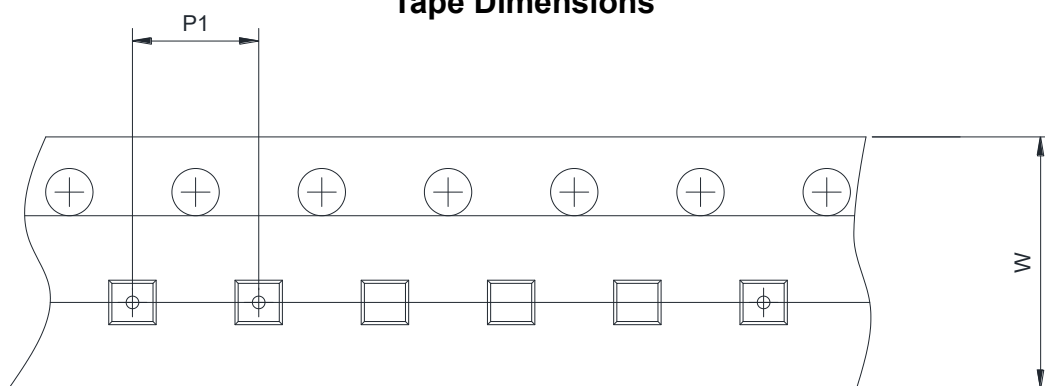
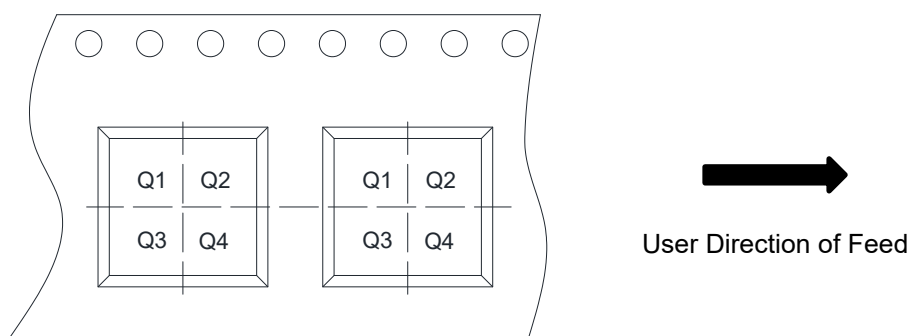


Transient thermal response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
SOT-23


RECOMMENDED LAND PATTERN(unit:mm)

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.20
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10
L	0.45	0.55	0.65
L 1	0.20	0.35	0.60
M	0.10	0.15	0.25
K	0.00	-	0.25
θ	0 °	-	8 °

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	☒ 7inch	☐ 13inch
W	Overall width of the carrier tape	☒ 8mm	☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm	☒ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☐ Q1	☐ Q2 ☒ Q3 ☐ Q4