

## P-Channel 20-V (D-S) MOSFET

### Key Features:

- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

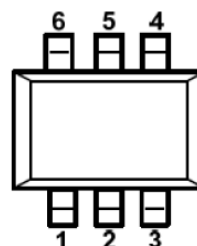
### Typical Applications:

- Battery Powered Instruments
- Portable Computing
- Mobile Phones
- GPS Units and Media Players



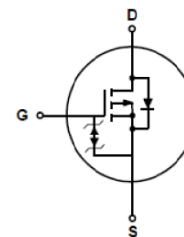
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-20	34 @ $V_{GS} = -4.5V$	-5
	48 @ $V_{GS} = -2.5V$	-3



Top view

TSOP6



Drain: 1,2,5,6 Gate: 3

Source: 4

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-5
		$T_A = 100^\circ\text{C}$	-3.3
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-20	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-1	A
Power Dissipation <sup>a</sup>	$P_D$	1.40	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	t $\leq$ 10 sec	62.5
		Steady State	110

### Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

## Electrical Characteristics

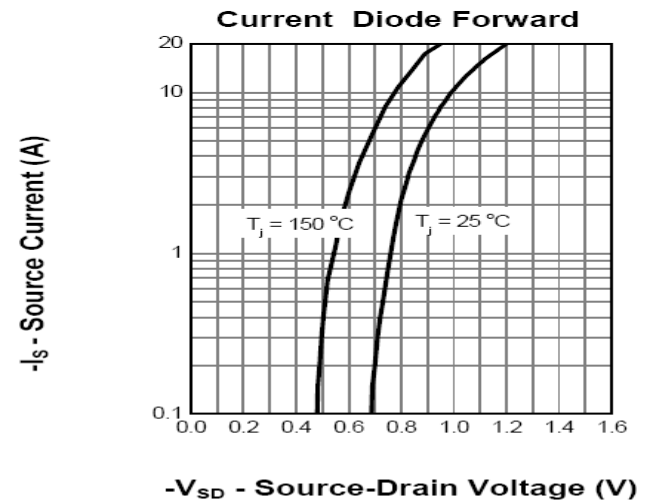
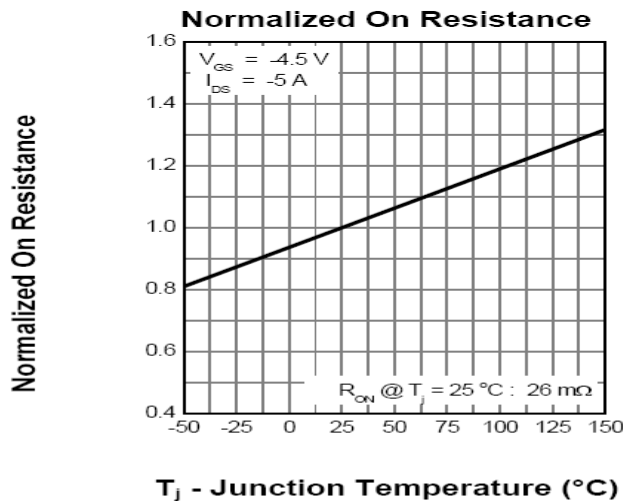
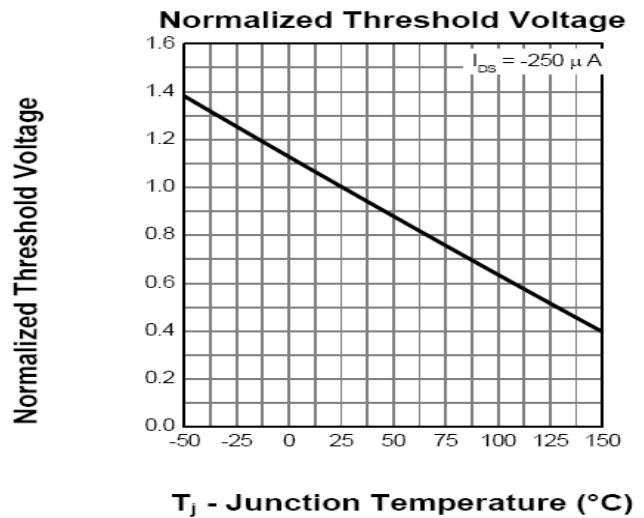
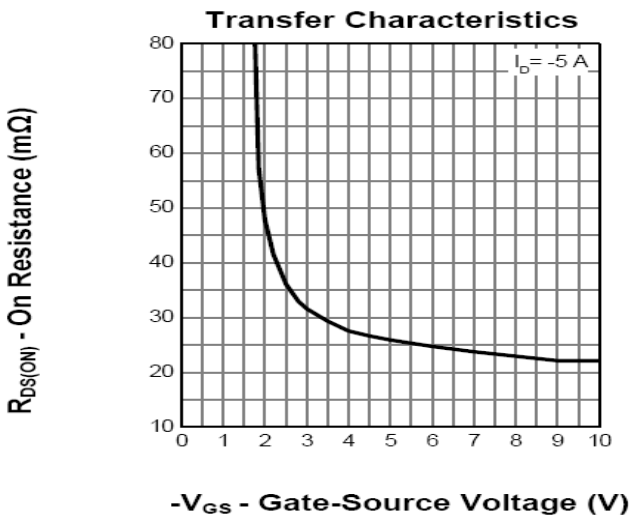
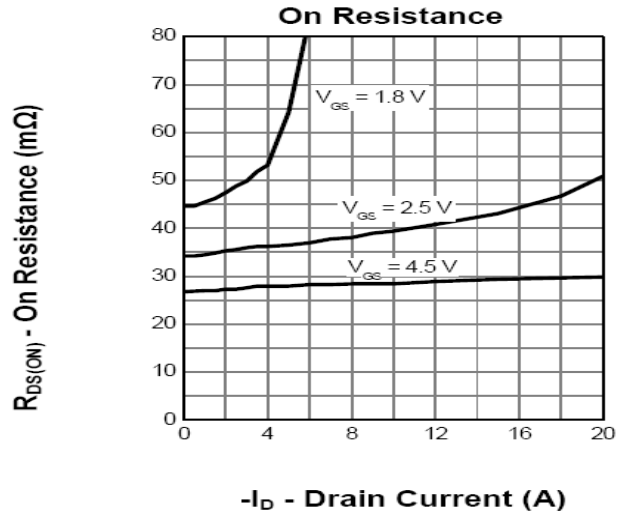
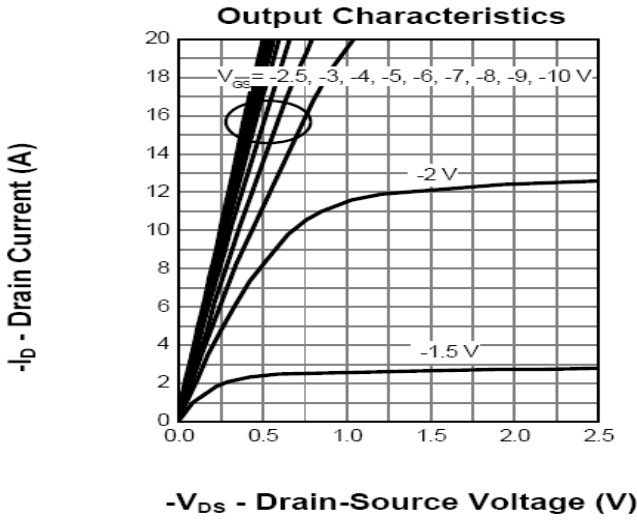
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-20			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 12 V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16 V, V_{GS} = 0 V$			-1	$\mu A$
		$V_{DS} = -16 V, V_{GS} = 0 V, T_J = 85^\circ C$			-30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -4.5 V$	10			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = -4.5 V, I_D = -5 A$			34	m $\Omega$
		$V_{GS} = -2.5 V, I_D = -3 A$			48	
Forward Transconductance	$g_{fs}$	$V_{DS} = -15 V, I_D = -5 A$		10		S
Diode Forward Voltage	$V_{SD}$	$I_S = -1.0 A, V_{GS} = 0 V$		-0.7		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -5 A$		16		nC
Gate-Source Charge	$Q_{gs}$			4		
Gate-Drain Charge	$Q_{gd}$			5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 V, R_L = 10 \Omega, I_D = -1 A,$ $V_{GEN} = -4.5 V, R_{GEN} = 6 \Omega$		6		ns
Rise Time	$t_r$			12		
Turn-Off Delay Time	$t_{d(off)}$			75		
Fall Time	$t_f$			38		
Input Capacitance	$C_{iss}$	$V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz$		1450		pF
Output Capacitance	$C_{oss}$			200		
Reverse Transfer Capacitance	$C_{rss}$			165		

## Notes

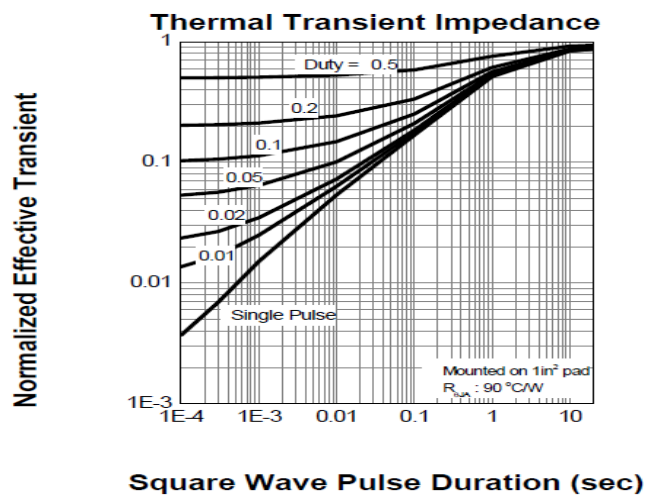
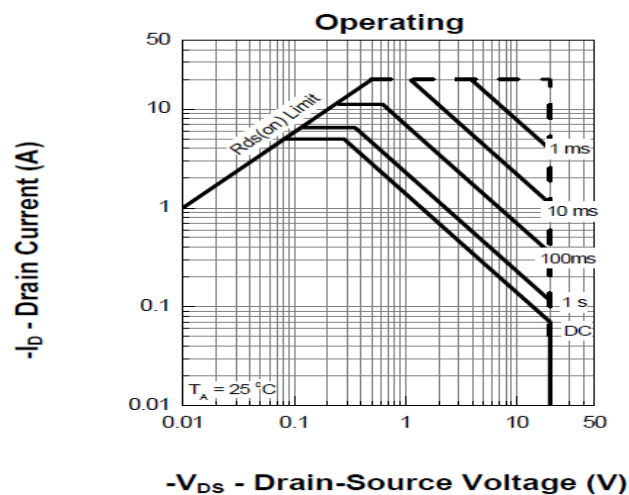
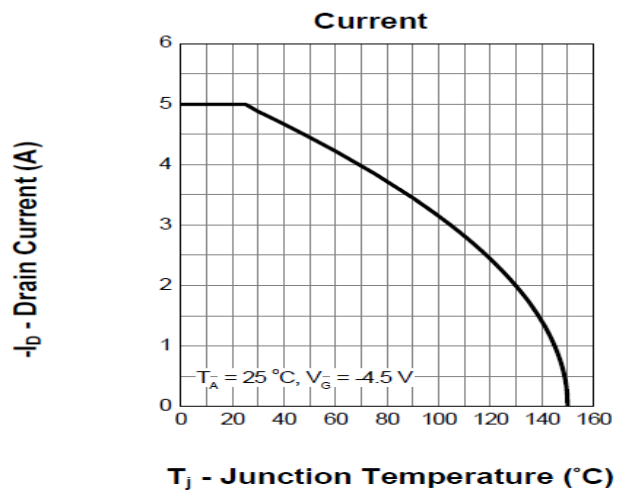
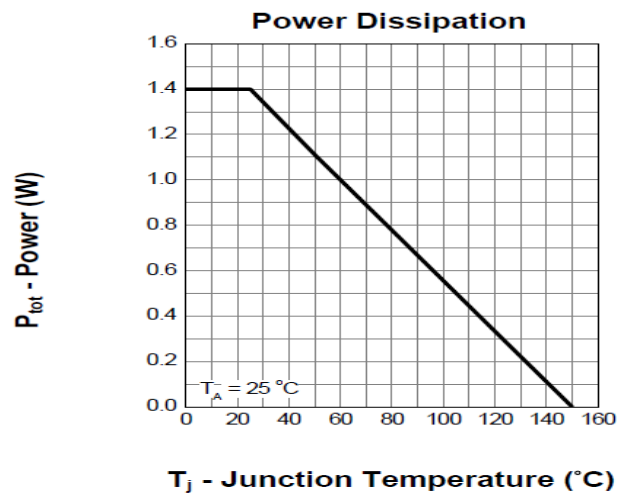
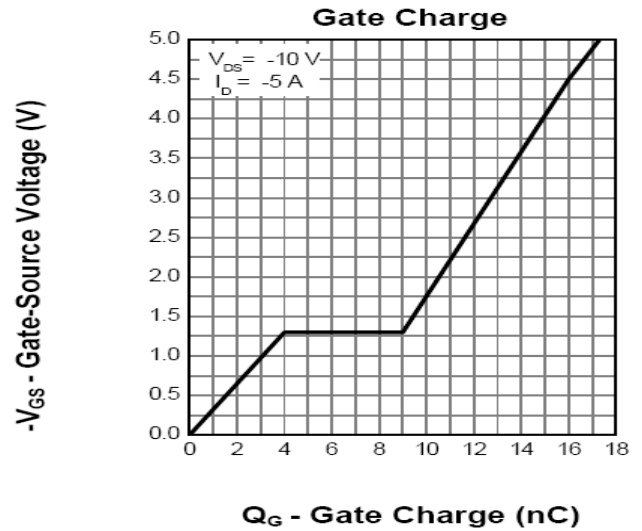
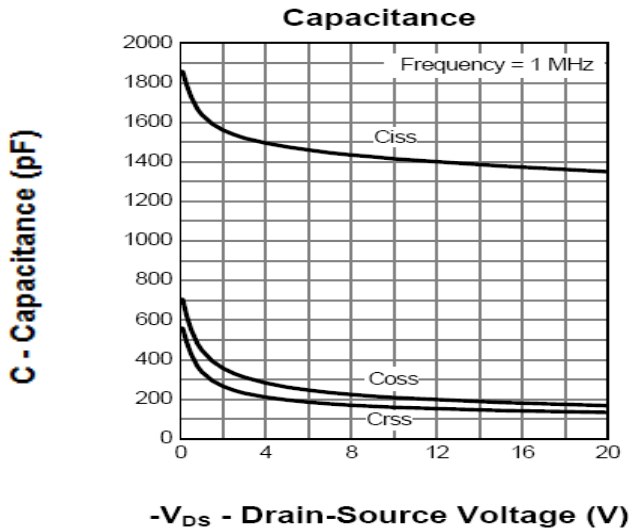
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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Typical Electrical Characteristics

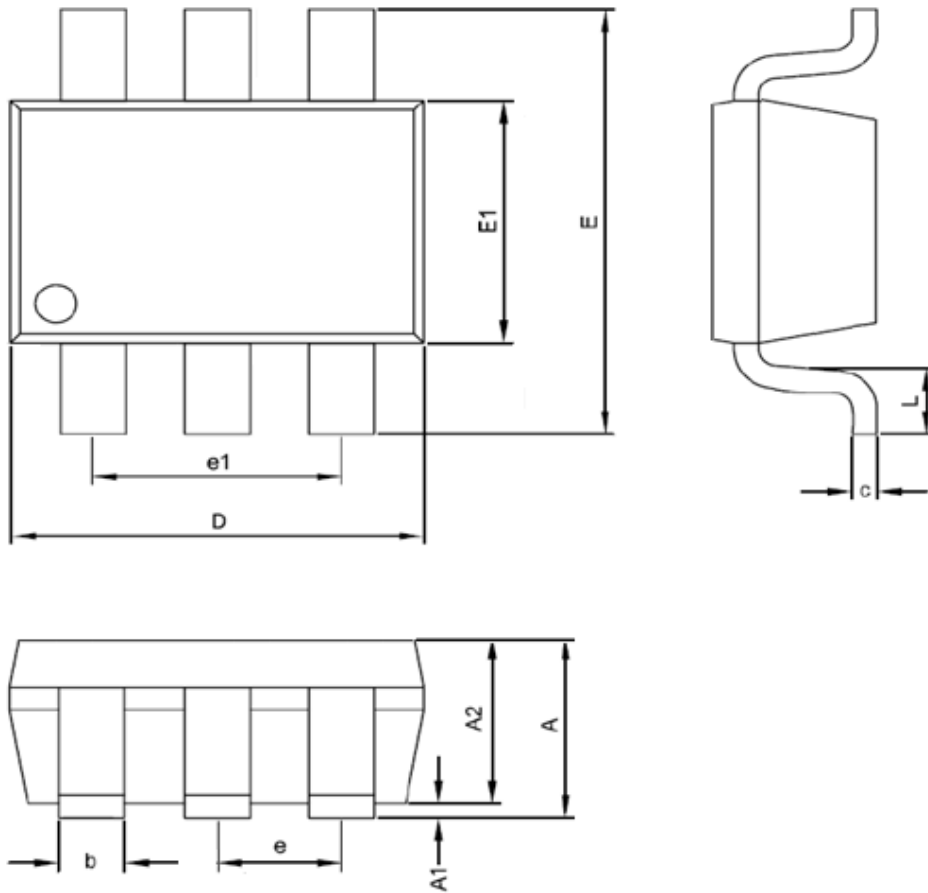


Typical Electrical Characteristics



## Package Information

## TSOP6



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	---	1.45
A1	---	0.15
A2	0.9	1.3
D	2.90 BSC	
E	2.890 BSC	
E1	1.5	1.7
c	0.08	0.25
b	0.3	0.5
e	0.95BSC	
e1	1.90BSC	
L	0.3	0.6