

**◆ DESCRIPTION**

These miniature surface mount MOSFETs utilize High Cell Density process. Low  $R_{DS(on)}$  assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry.

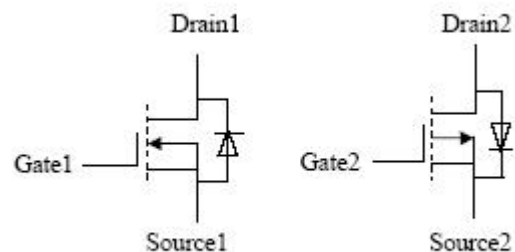
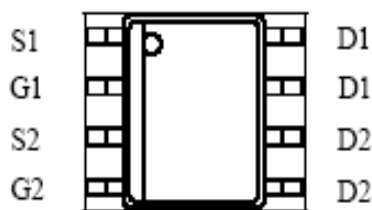
Typical applications are PWM DC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

**◆ FEATURES**

- 100V/9.8A,  $R_{DS(ON)} = 155m\Omega @ V_{GS} = 10V$
- -100V/-9A,  $R_{DS(ON)} = 160m\Omega @ V_{GS} = -10V$
- 100V/9.8A,  $R_{DS(ON)} = 175m\Omega @ V_{GS} = 4.5V$
- -100V/-9A,  $R_{DS(ON)} = 185m\Omega @ V_{GS} = -4.5V$
- Fast switching speed
- SOP-8 package design

**◆ APPLICATIONS**

- Power Management in Note
- Portable Equipment
- Battery Powered System
- Load Switch
- LCD Display inverter

**◆ PIN CONFIGURATION**


**◆ ABSOLUTE MAXIMUM RATINGS**

 (T<sub>A</sub>=25°C Unless Otherwise Noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V <sub>DS</sub>	100	-100	V
Gate-Source Voltage		V <sub>GS</sub>	20	20	V
Continuous Drain Current <sup>a</sup>	T <sub>A</sub> =25°C	I <sub>D</sub>	9.8	-9	A
	T <sub>A</sub> =70°C		7	-6	
Pulsed Drain Current <sup>b</sup>		I <sub>DM</sub>	37	-37	A
Power Dissipation <sup>a</sup>	T <sub>A</sub> =25°C	P <sub>D</sub>	2.5		W
	T <sub>A</sub> =70°C		1.6		
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to 150		°C
Lead Temperature (1/16" from case for 10sec)		T <sub>L</sub>	275		°C

**◆ THERMAL RESISTANCE RATINGS**

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Ambient	R <sub>θJA</sub>	50	°C/W
Junction-to-Case	R <sub>θJC</sub>	30	°C/W

Note :

- a. Pulse width limited by maximum junction temperature.
- b. Duty cycle ≤ 1%

**◆ ORDERING INFORMATION**

Device	Package	Shipping
MT4600	SOP-8	2,500 Units/ Tape & Reel

**◆ ELECTRICAL CHARACTERISTICS**

ELECTRICAL CHARACTERISTICS (TC = 25 °C, Unless Otherwise Noted)

Static Parameters							
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
Drain-Source Breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	N	100	-	-	V
		$V_{GS}=0V, I_D=250\mu A$	P	-100	-	-	
Gate threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	N	2	3	4	V
		$V_{DS}=V_{GS}, I_D=250\mu A$	P	-2	-3	-4	
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$	N	-	-	$\pm 250$	nA
		$V_{DS}=0V, V_{GS}=\pm 20V$	P	-	-	$\pm 250$	
Zero Gate Voltage Drain current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	N	-	-	1	uA
		$V_{DS}=-80V, V_{GS}=0V$	P	-	-	-1	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS}=5V, V_{GS}=10V$	N	20	-	-	A
		$V_{DS}=-5V, V_{GS}=-10V$	P	-20	-	-	
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.5A$	N	-	125	155	mΩ
		$V_{GS}=-10V, I_D=-5.5A$	P	-	130	160	
		$V_{GS}=4.5V, I_D=4A$	N	-	140	175	
		$V_{GS}=-4.5V, I_D=-4A$	P	-	145	185	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS}=50V, I_D=5.5A$	N	-	2	-	S
		$V_{DS}=-50V, I_D=-5.5A$	P	-	1.6	-	
Dynamic Parameters							
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
Input Capacitance	$C_{ISS}$	N-Channel	N	-	560	-	pF
			P	-	1200	-	
Output Capacitance	$C_{OSS}$	$V_{GS}=0V, V_{DS}=25V, f=1MHz$ P-Channel	N	-	81	-	pF
			P	-	100	-	
Reverse Transfer Capacitance	$C_{RSS}$	$V_{GS}=0V, V_{DS}=-25V, f=1MHz$	N	-	10	-	pF
			P	-	65	-	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	N	-	1.7	3	Ω
			P	-	3	5	
Total Gate Charge <sup>2</sup>	$Q_g$	N-Channel $V_{DS}=0.5V_{(BR)DSS}, V_{GS}=10V,$ $I_D=9.6A$	N	-	22	-	nC
Gate-Source Charge <sup>2</sup>	$Q_{gs}$	P-Channel $V_{DS}=-0.5V_{(BR)DSS}, V_{GS}=-10V,$ $I_D=-5.5A$	N	-	5.2	-	
			P	-	8	-	
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$		N	-	7	-	
			P	-	16	-	
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	N-Channel	N	-	2.2	4.4	nS
			P	-	6.7	13.4	
Rise Time <sup>2</sup>	$t_r$	$V_{DS}=10V, I_D \cong 1A,$ $V_{GS}=10V, R_{GEN}=6\Omega$	N	-	7.5	15	nS
			P	-	9.7	19.4	
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$	P-Channel $V_{DS}=-10V, I_D \cong -1A,$ $V_{GS}=-10V, R_{GEN}=6\Omega$	N	-	11.8	21.3	nS
			P	-	19.8	35.6	
Fall-Time <sup>2</sup>	$t_f$		N	-	3.7	7.4	nS
			P	-	12.3	22.2	

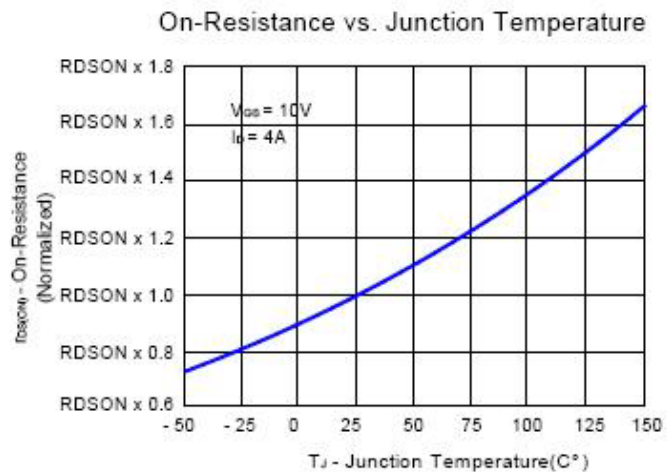
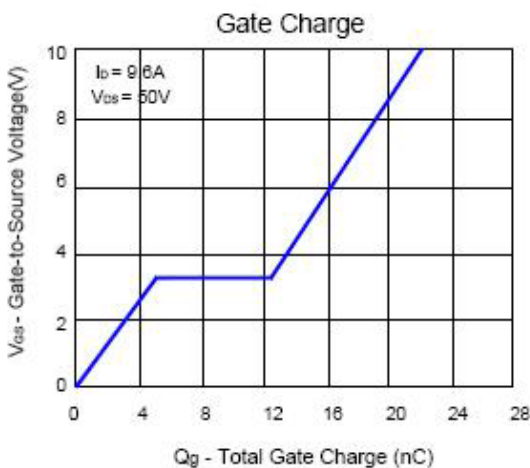
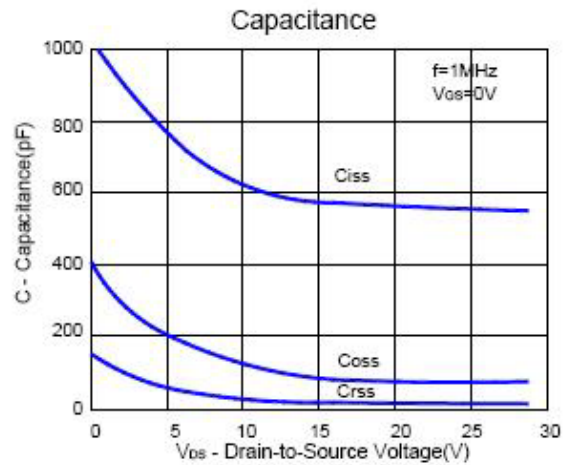
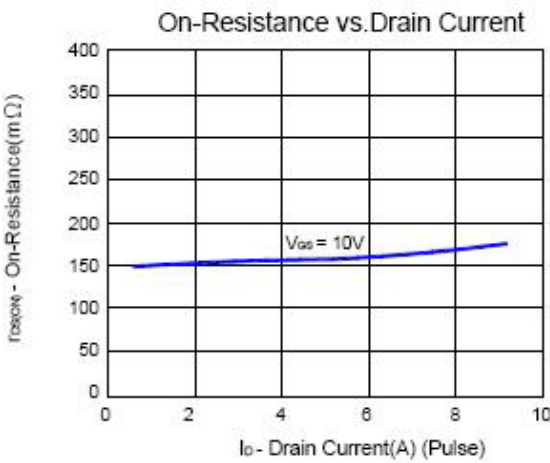
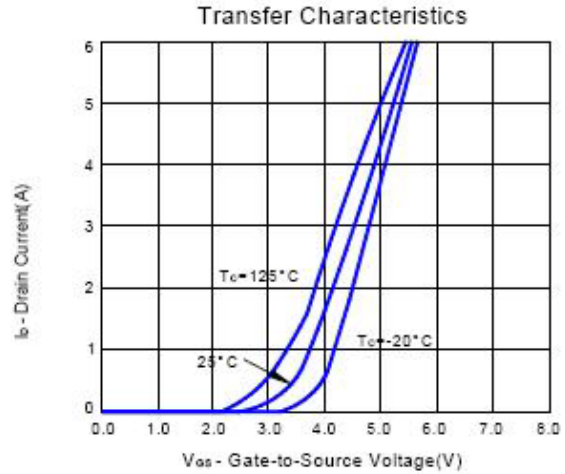
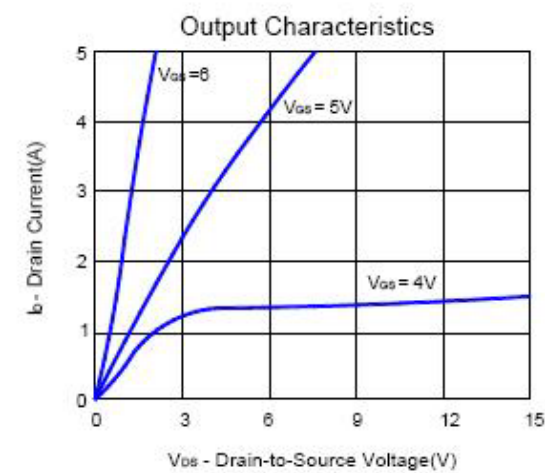
**◆ ELECTRICAL CHARACTERISTICS**

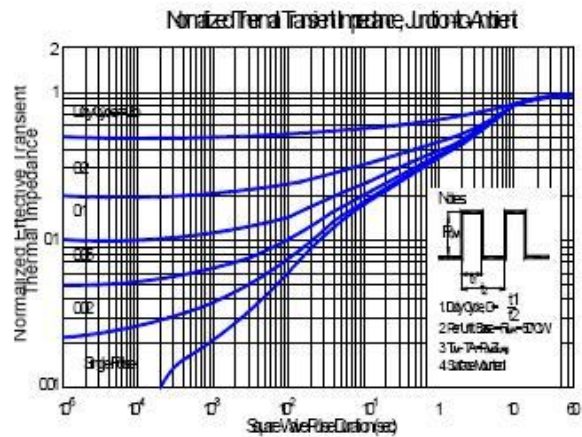
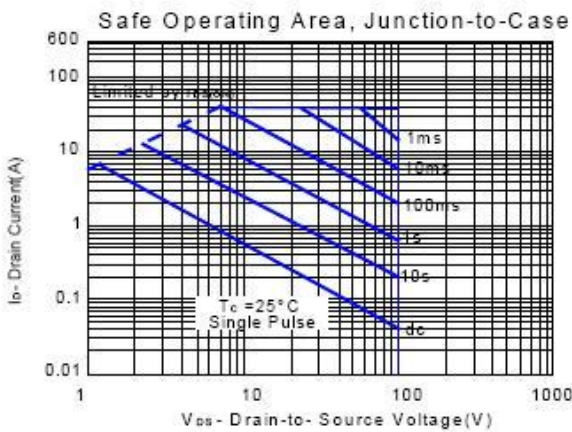
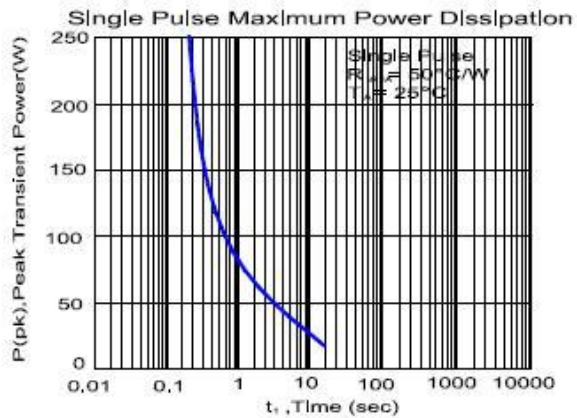
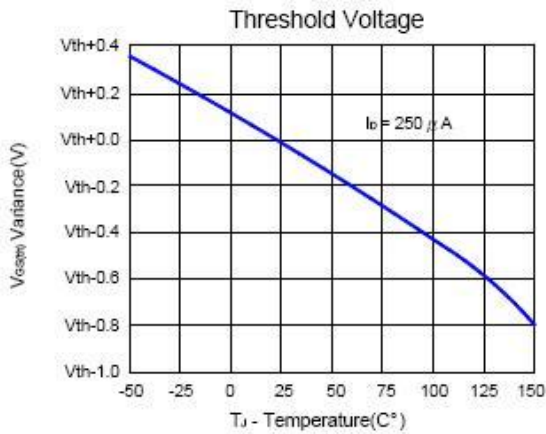
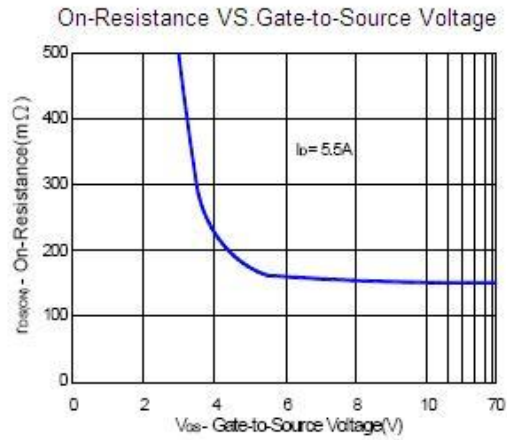
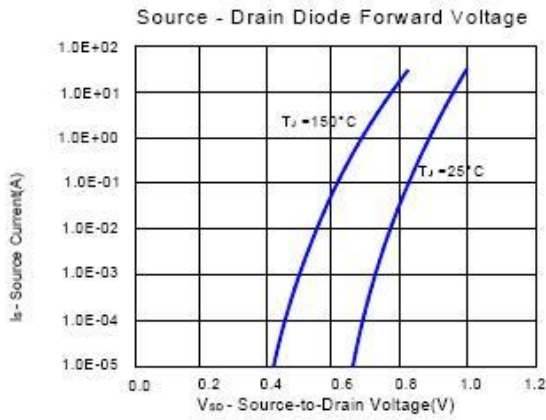
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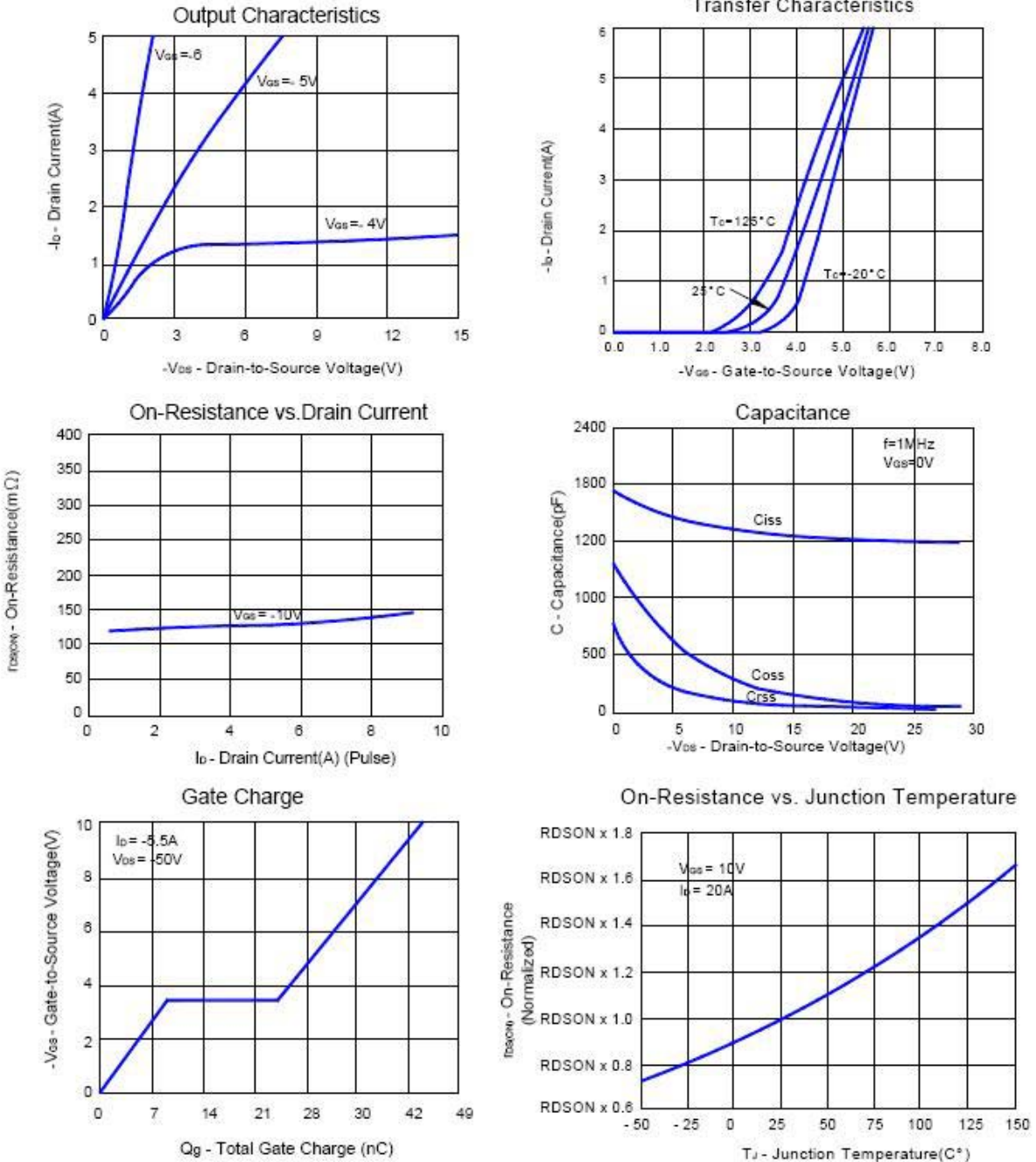
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
Source-Drain Diode Ratings and Characteristics(T <sub>C</sub> =25 °C)							
Continuous Current	I <sub>S</sub>		N	-	-	9.6	A
			P	-	-	-9.6	
Pulsed Current <sup>3</sup>	I <sub>SM</sub>		N	-	-	37	
			P	-	-	-37	
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V	N	-	-	1.4	V
		I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V	P	-	-	-1.4	

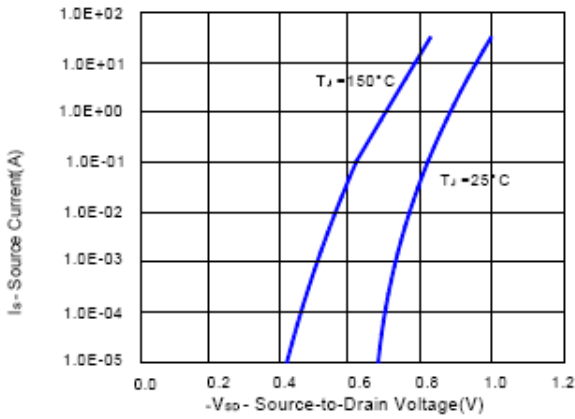
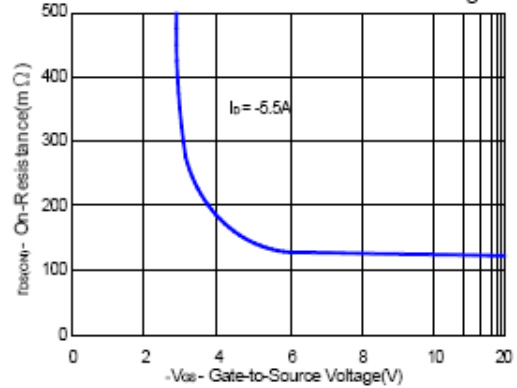
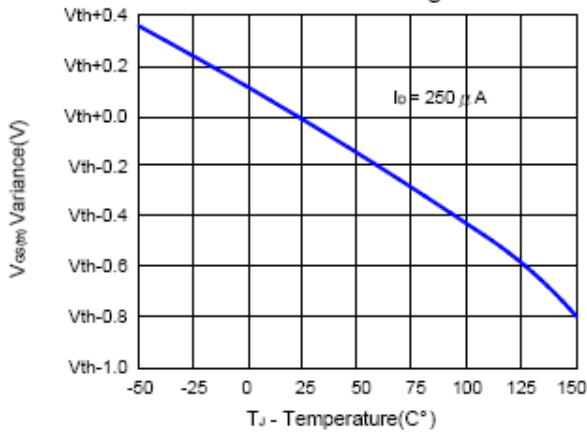
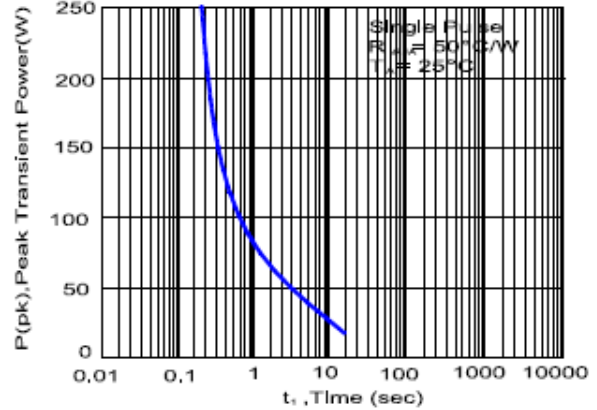
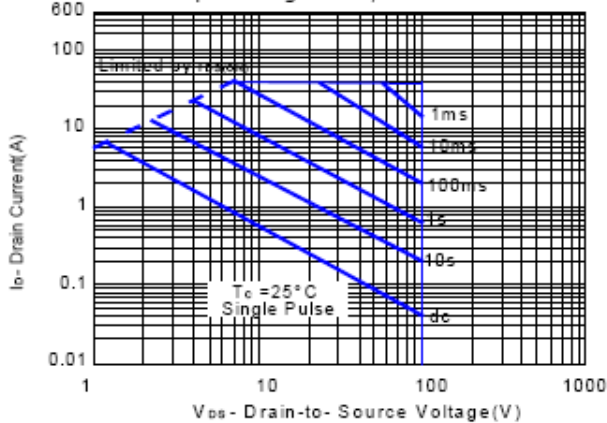
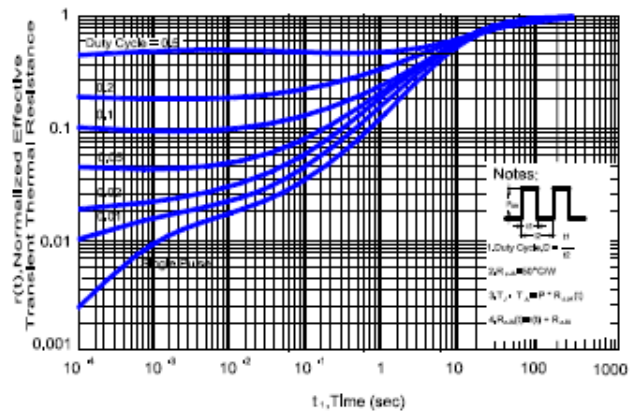
Note :

- A . Pulse test: PW<=300usec, duty cycle <=2%
- B. Independent of operating temperature.
- C. Pulse width Limited by maximum junction temperature

**◆ TYPICAL CHARACTERISTICS (N-Channel)**




**◆ TYPICAL CHARACTERISTICS (P-Channel)**


**Source - Drain Diode Forward Voltage**

**On-Resistance vs. Gate-to-Source Voltage**

**Threshold Voltage**

**Single Pulse Maximum Power Dissipation**

**Safe Operating Area, Junction-to-Case**

**Transient Thermal Response Curve**




**◆ PHYSICAL DIMENSIONS**
**8-Pin Plastic S.O.I.C.**
