

## Product Summary

- $V_{DS}$  -20V
- $I_D$  -4.2A
- $R_{DS(ON)}$ ( at  $V_{GS}=10V$ ) <40m $\Omega$
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

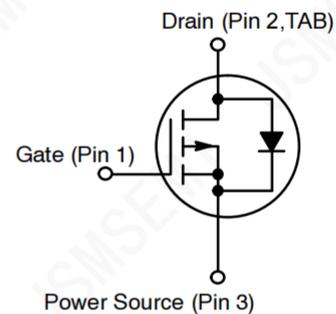


## General Description

- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



## Absolute maximum ratings ( $T_A=25^{\circ}C$ Unless otherwise noted )

Symbol	Parameter		Typical	Unit
$V_{DSS}$	Drain-Source Voltage		-20	V
$V_{GSS}$	Gate-Source Voltage		$\pm 10$	V
$I_D$	Continuous Drain Current ( $T_C=25^{\circ}C$ )	$V_{GS}=-10V$	-4.2	A
	Continuous Drain Current ( $T_C=70^{\circ}C$ )		-3.5	A
$I_{DM}$	Pulsed Drain Current		-20	A
$P_D$	Power Dissipation	$T_A=25^{\circ}C$	1.5	W
		$T_A=70^{\circ}C$	0.9	
$T_J$	Operation Junction Temperature		150	$^{\circ}C$
$T_{STG}$	Storage Temperature Range		-55~+150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient		120	$^{\circ}C/W$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

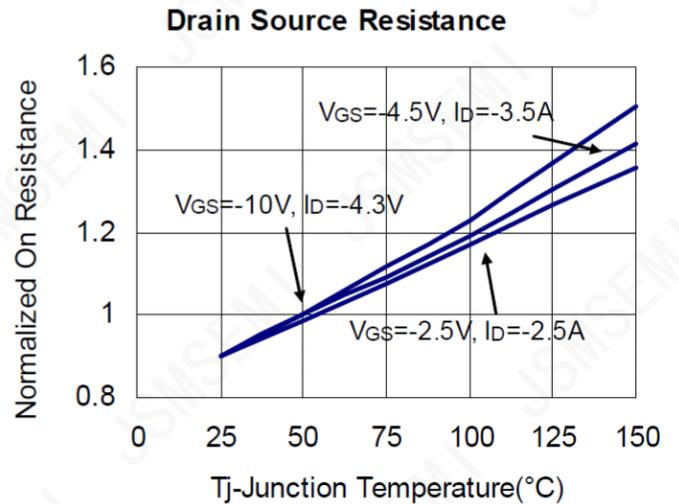
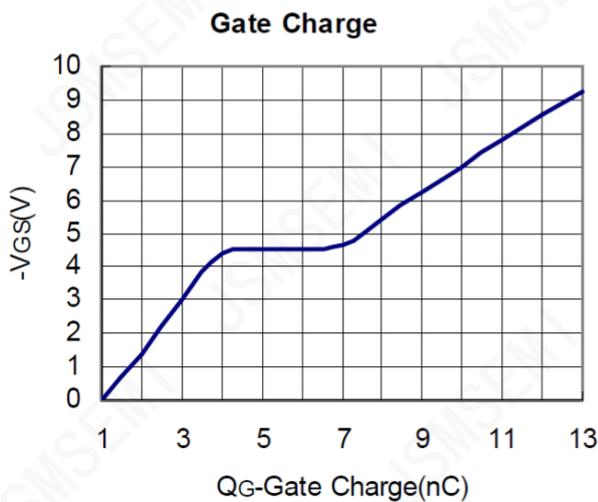
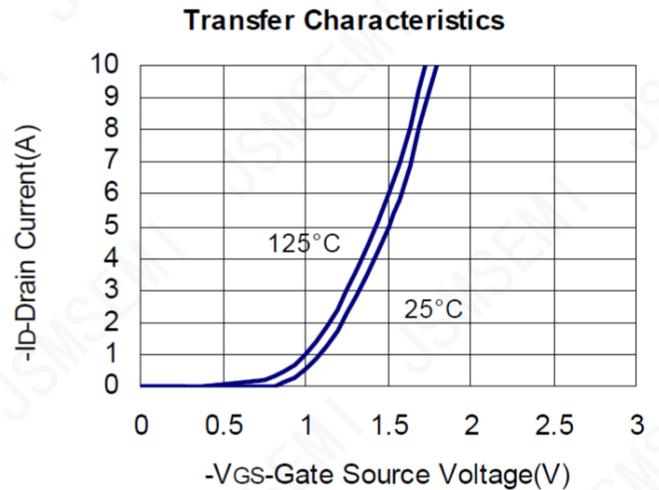
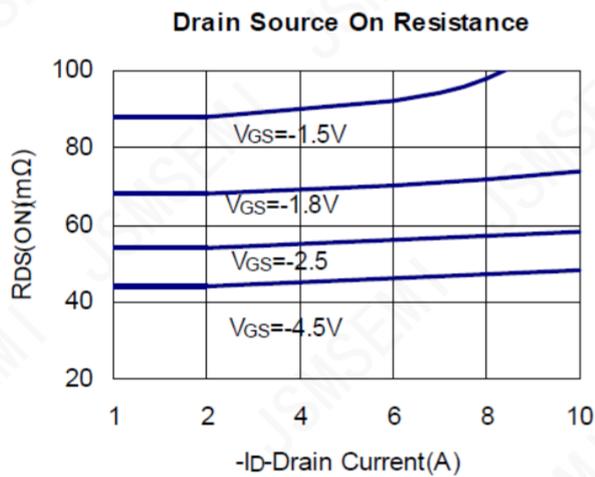
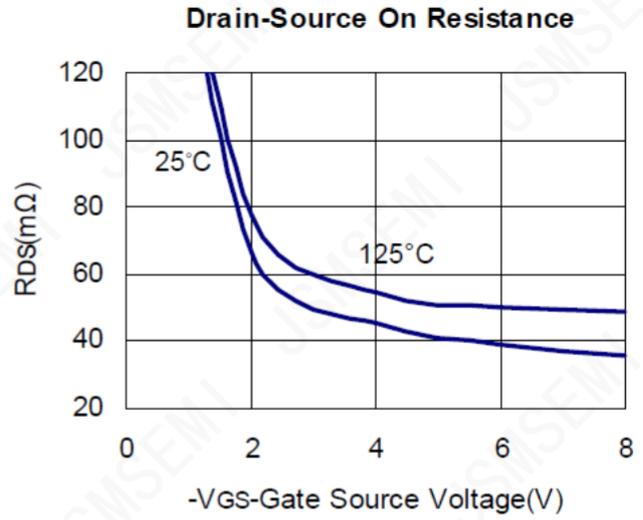
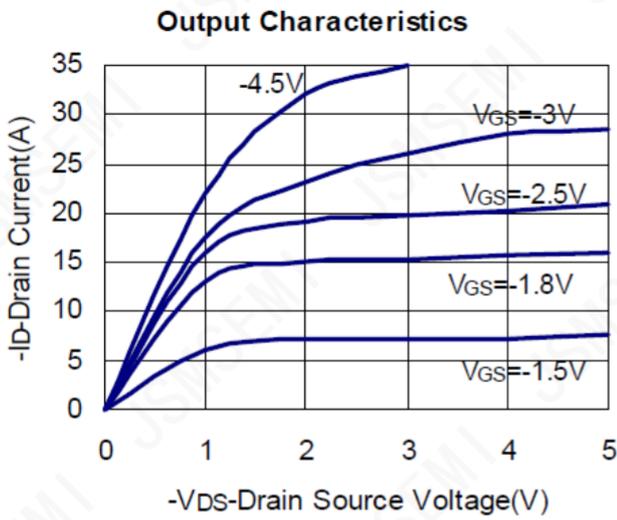
**Electrical characteristics** ( $T_A=25^\circ\text{C}$  Unless otherwise noted)

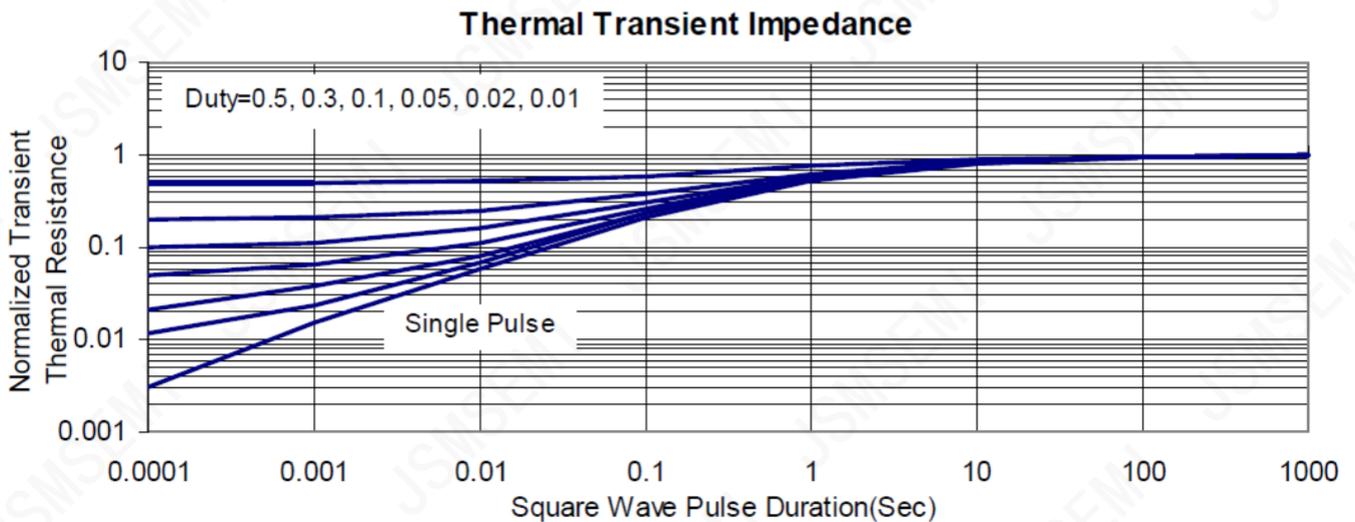
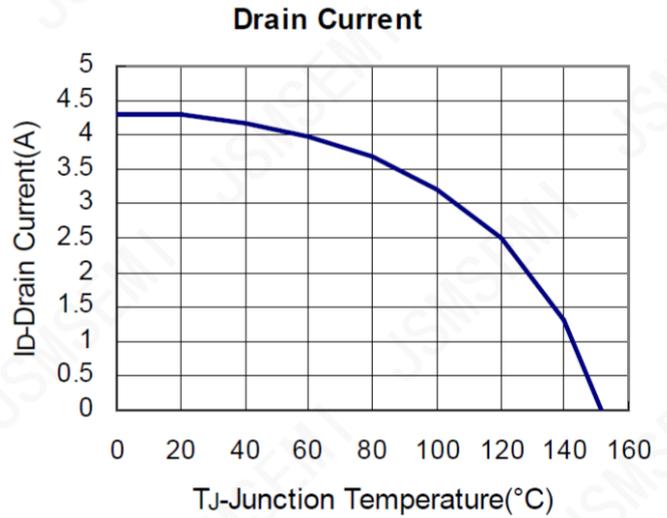
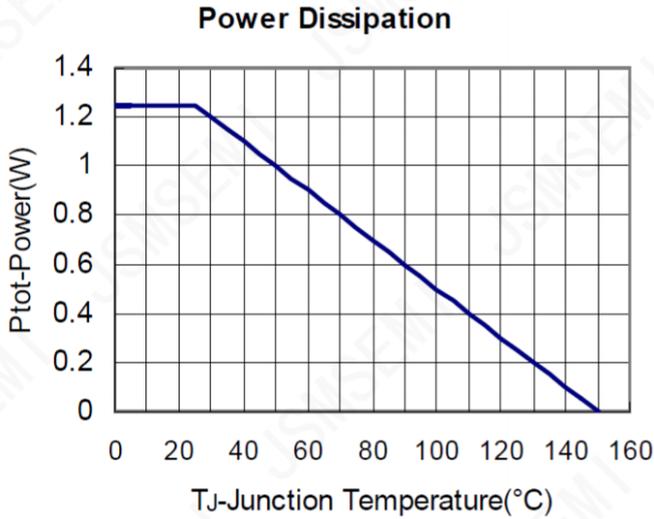
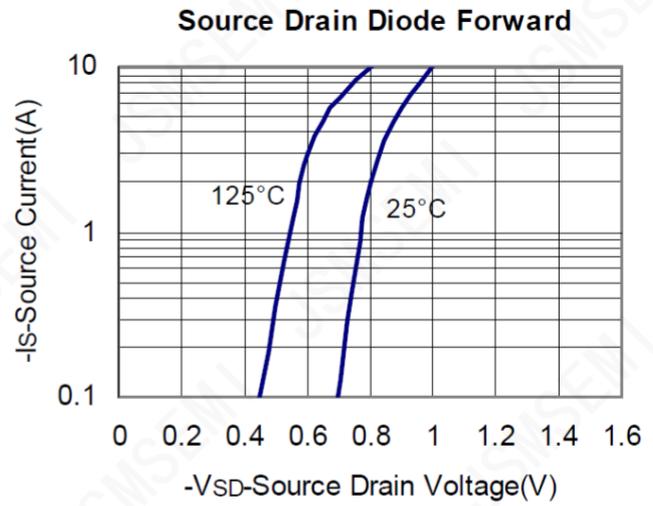
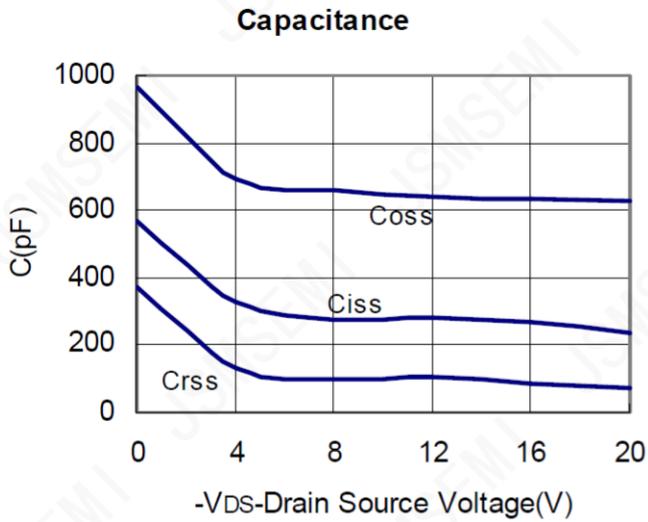
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3		-1.0	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0$			-1	uA
		$V_{DS}=-20V, V_{GS}=0$ $T_J=55^\circ\text{C}$			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-4.0A$		30	40	m $\Omega$
		$V_{GS}=-2.5V, I_D=-4.0A$		40	60	
		$V_{GS}=-1.8V, I_D=-2.0A$		56	78	
		$V_{GS}=-1.5V, I_D=-1.0A$		85	110	
$G_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-4.0A$		22		S
<b>Source-Drain Diode</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=-1.0A, V_{GS}=0V$		-0.67	-1.2	V
<b>Dynamic Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-4.0A$		11.1		nC
$Q_{gs}$	Gate-Source Charge			3.1		
$Q_{gd}$	Gate-Drain Charge			2.4		
$C_{iss}$	Input Capacitance	$V_{DS}=-10V$ $V_{GS}=0V$ $f=1\text{MHz}$		989		pF
$C_{oss}$	Output Capacitance			167		
$C_{rss}$	Reverse Transfer Capacitance			75.5		
$T_{d(on)}$	Turn-On Time	$V_{DS}=-10V$ $I_D=-3.7A$ $V_{GEN}=-4.5V, R_G=1\Omega$		712		nS
$T_r$				1386		
$T_{d(off)}$	Turn-Off Time			9.1		
$T_f$				4		

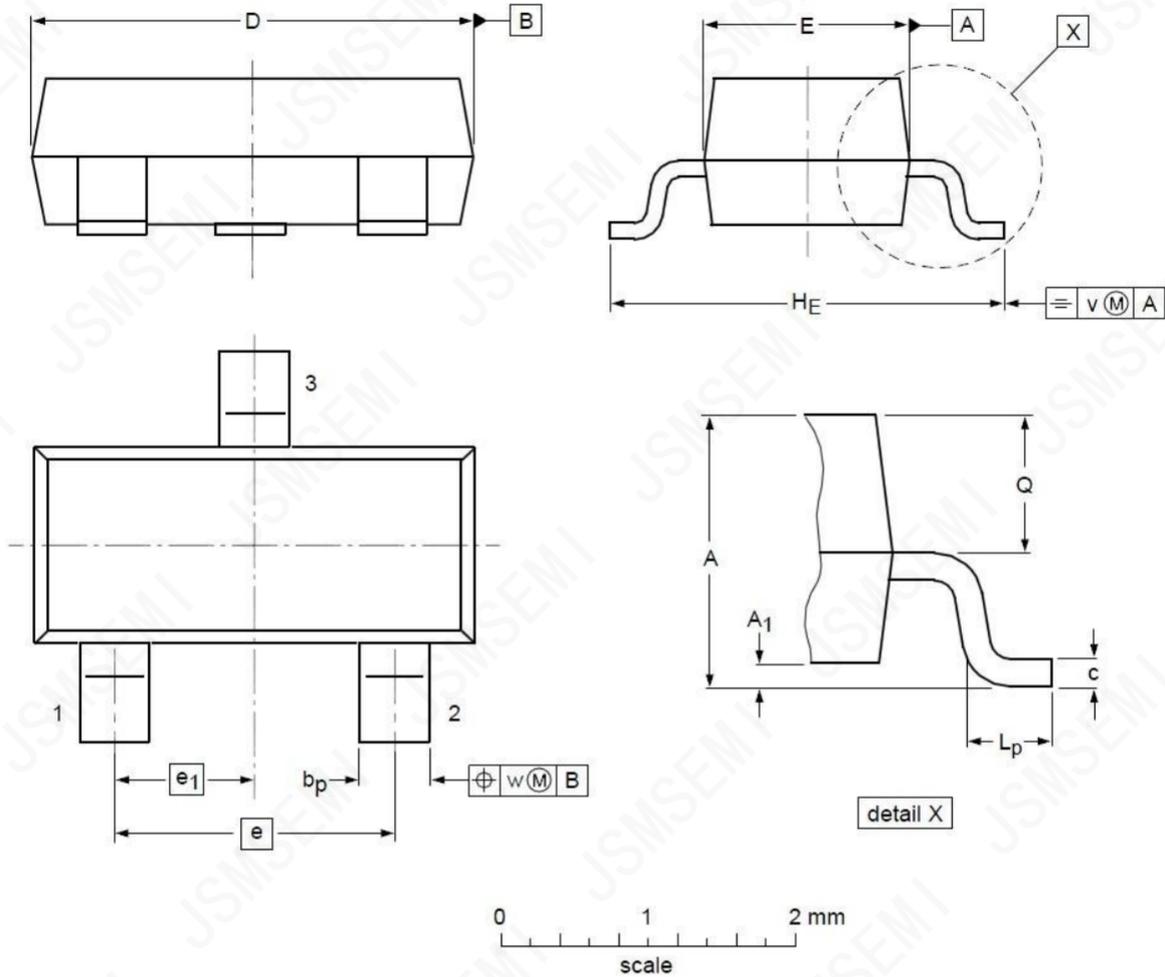
Note: 1. Pulse test: pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2\%$

2. Static parameters are based on package level with recommended wire bonding

**Typical characteristics**(25°C Unless Note)



**Typical characteristics** (continuous)


**Package Information**  
**SOT-23**

**DIMENSIONS** (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A <sub>1</sub>	0.01	0.05	0.10
b <sub>p</sub>	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e <sub>1</sub>	--	0.95	--
H <sub>E</sub>	2.25	2.40	2.55	L <sub>p</sub>	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				