



**P-channel -40V, -30A, TO-252 Trench Power MOSFET 溝槽式功率場效應管**

**■Features 特點**

Low on-resistance and maximum DC current capability 低導通電阻和最大直流電流能力

Super high density cell design 超高元胞密度設計

$R_{DS(ON)} \leq 18m\Omega @ V_{GS} = -10V$

$R_{DS(ON)} \leq 25m\Omega @ V_{GS} = -4.5V$

**■Applications 應用**

Power Management in Note book 筆記本電源管理

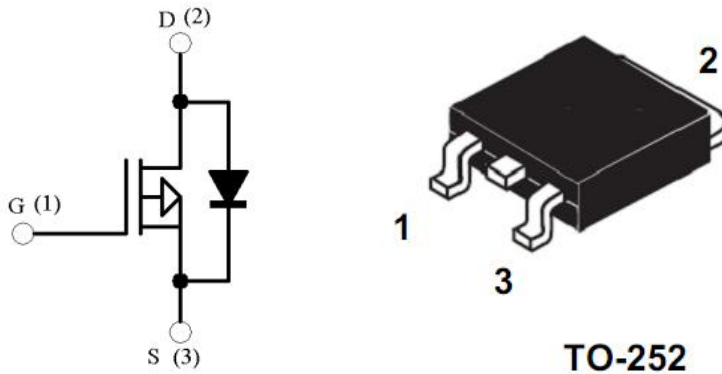
Portable Equipment 便攜式設備

Battery Powered System 電池電源系統

DC/DC Converter 直流/直流變換

Load Switch 負載開關應用

**■Internal Schematic Diagram 內部結構**



**■Absolute Maximum Ratings 最大額定值**

Characteristic 特性參數	Symbol 符號	Rat 額定值	Unit 單位
Drain-Source Voltage 漏極-源極電壓	$BV_{DSS}$	-40	V
Gate- Source Voltage 柵極-源極電壓	$V_{GS}$	$\pm 20$	V
Drain Current (continuous)漏極電流-連續	$I_D$ (at $T_A = 25^\circ C$ )	-30	A
Drain Current (pulsed)漏極電流-脈沖	$I_{DM}$	-100	A
Total Device Dissipation 總耗散功率	$P_{TOT}$ (at $T_A = 25^\circ C$ at $T_A = 70^\circ C$ )	25 16	W
Thermal Resistance Junction-Ambient 熱阻	$R_{\theta JA}$	50	$^\circ C/W$
Junction/Storage Temperature 結溫/儲存溫度	$T_J, T_{stg}$	-55~150	$^\circ C$



■ Electrical Characteristics 電特性

( $T_A=25^{\circ}\text{C}$  unless otherwise noted 如無特殊說明，溫度為  $25^{\circ}\text{C}$ )

Characteristic 特性參數	Symbol 符號	Min 最小值	Typ 典型值	Max 最大值	Unit 單位
Drain-Source Breakdown Voltage 漏極-源極擊穿電壓( $I_D=-250\mu\text{A}, V_{GS}=0\text{V}$ )	$BV_{DSS}$	-40	—	—	V
Gate Threshold Voltage 柵極開啓電壓( $I_D=-250\mu\text{A}, V_{GS}=V_{DS}$ )	$V_{GS(th)}$	-1.5	—	-3	V
Zero Gate Voltage Drain Current 零柵壓漏極電流( $V_{GS}=0\text{V}, V_{DS}=-40\text{V}$ )	$I_{DSS}$	—	—	-1	$\mu\text{A}$
Gate Body Leakage 柵極漏電流( $V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$ )	$I_{GSS}$	—	—	$\pm 100$	nA
Static Drain-Source On-State Resistance 靜態漏源導通電阻( $I_D=-12\text{A}, V_{GS}=-10\text{V}$ ) ( $I_D=-6\text{A}, V_{GS}=-4.5\text{V}$ )	$R_{DS(ON)}$	—	15 18	18 25	$\text{m}\Omega$
Diode Forward Voltage Drop 內附二極管正向壓降( $I_{SD}=-1.7\text{A}, V_{GS}=0\text{V}$ )	$V_{SD}$	—	—	-1.2	V
Input Capacitance 輸入電容 ( $V_{GS}=0\text{V}, V_{DS}=-20\text{V}, f=1\text{MHz}$ )	$C_{ISS}$	—	2760	—	pF
Common Source Output Capacitance 共源輸出電容( $V_{GS}=0\text{V}, V_{DS}=-20\text{V}, f=1\text{MHz}$ )	$C_{OSS}$	—	260	—	pF
Reverse Transfer Capacitance 回饋電容( $V_{GS}=0\text{V}, V_{DS}=-20\text{V}, f=1\text{MHz}$ )	$C_{RSS}$	—	120	—	pF
Gate Source Charge 柵源電荷密度 ( $V_{DS}=-20\text{V}, I_D=-12\text{A}, V_{GS}=-4.5\text{V}$ )	$Q_{gs}$	—	11	—	nC
Gate Drain Charge 柵漏電荷密度 ( $V_{DS}=-20\text{V}, I_D=-12\text{A}, V_{GS}=-4.5\text{V}$ )	$Q_{gd}$	—	9.5	—	nC
Turn-On Delay Time 開啓延遲時間 ( $V_{DS}=-15\text{V}, I_D=-1\text{A}, R_{GEN}=6\Omega, V_{GS}=-10\text{V}$ )	$t_{d(on)}$	—	48	—	ns
Turn-On Rise Time 開啓上升時間 ( $V_{DS}=-15\text{V}, I_D=-1\text{A}, R_{GEN}=6\Omega, V_{GS}=-10\text{V}$ )	$t_r$	—	24	—	ns
Turn-Off Delay Time 關斷延遲時間 ( $V_{DS}=-15\text{V}, I_D=-1\text{A}, R_{GEN}=6\Omega, V_{GS}=-10\text{V}$ )	$t_{d(off)}$	—	88	—	ns
Turn-On Fall Time 開啓下降時間 ( $V_{DS}=-15\text{V}, I_D=-1\text{A}, R_{GEN}=6\Omega, V_{GS}=-10\text{V}$ )	$t_f$	—	34	—	ns

■ TYPICAL CHARACTERISTIC CURVE 典型特性曲线

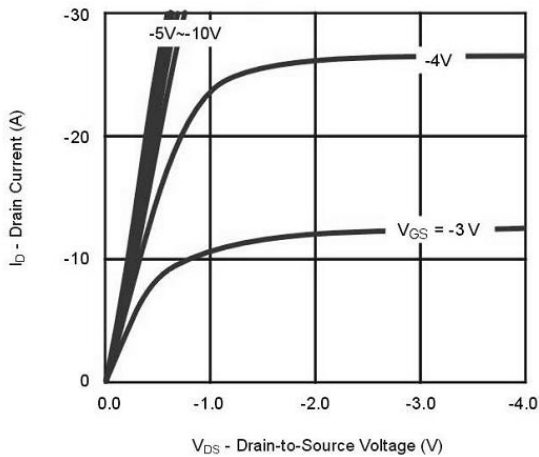


Figure 1. Output Characteristics

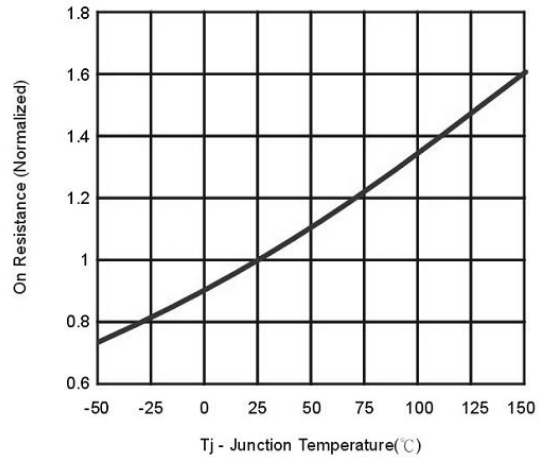


Figure 2. On-Resistance Variation with Temperature

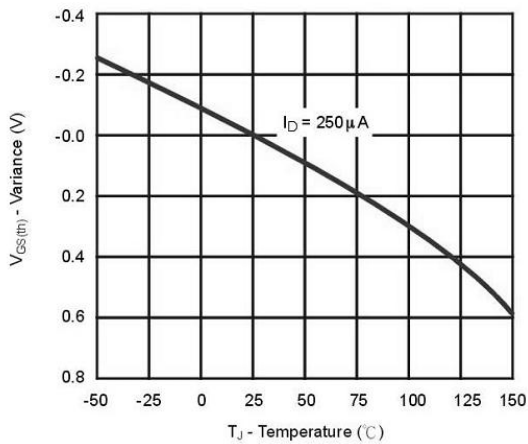


Figure 3. Gate Threshold Variation with Temperatures

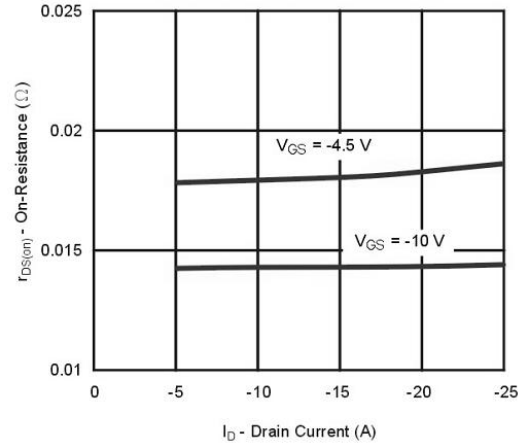


Figure 4. On-Resistance Variation with Drain Current

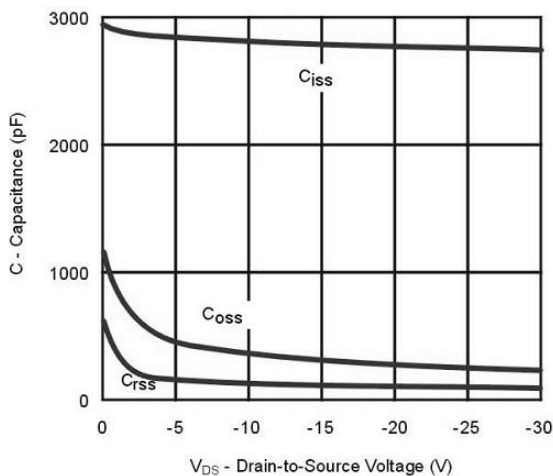


Figure 5. Capacitance Variation with Drain-source Voltage

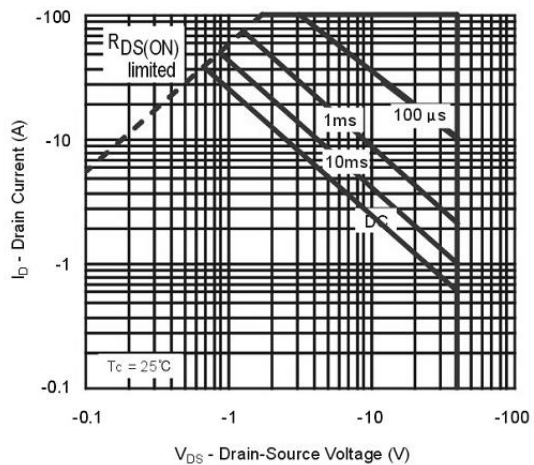
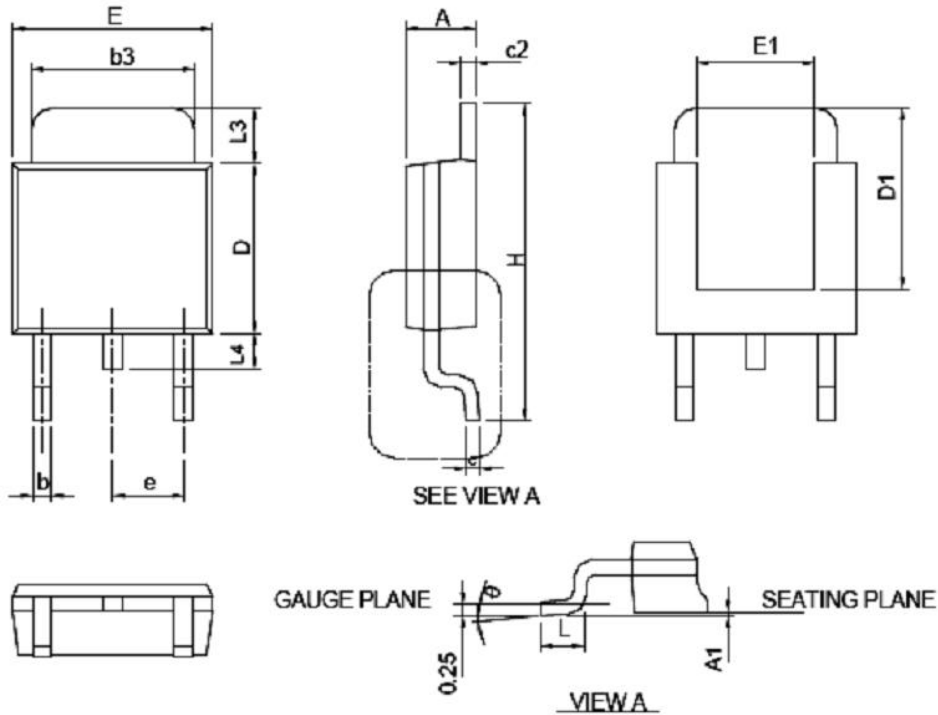


Figure 6. Maximum Safe Operating Area



■DIMENSION 外形封裝尺寸



SYMBOL	TO-252			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1		0.13		0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4		1.02		0.040
0	0°	8°	0°	8°